End-to-end Ethernet? IEEE task force developing carrier-grade Ethernet to compete against DSL and SONET. PAGE 37.

Ethernet MAN vendors. New players offer less expensive, more flexible broadband access. PAGE 39.

NetworkWorld

The leader in network knowledge ■ www.nwfusion.com
September 17, 2001 ■ Volume 18, Number 38

Internet, telecom networks put to test in wake of terrorist strikes on U.S.

■ **BY NETWORK WORLD STAFF**

Last week's kamikaze-style terrorist attacks on the World Trade Center and Pentagon exposed the weaknesses and strengths of America's communications systems, which played such a critical role in the aftermath of the destruction.

As people reached for phones in horror and shock on Tuesday morning to contact family, friends and business associates, many found landline circuits jammed and cellular service unavailable.

Verizon's networks struggled to handle twice the usual call volume even as the carrier lost key cell towers and voice switches housed near the site of destruction. Reviving a major Verizon facility adjacent to where the World Trade Center towers stood is considered key to getting the U.S. stock markets reopened.

Many individuals say they found Internet-based e-mail and the Web to be the more reliable form of communication as events unfolded.

See Attack, page 8

AP PHOTO/SHAWN BALDWIN

Firefighters on the grim job sift through rubble at the World Trade Center complex, where telecom firms are looking to recover key facilities.

More online! Read expanded coverage and find out where you can donate money and IT expertise to aid attack victims. www.nwfusion.com, DocFinder: 6055

Q A

CLEC exec debunks market myths

In just a few years, Bill Rouhana Jr. built Winstar Communications into a competitive local exchange carrier operating in 74 markets and worth $6 billion. Now the fixed wireless company is in Chapter 11 and up for sale. Network World *Editor in Chief John Dix and Senior Writer Michael Martin spoke with Rouhana in his largely vacant New York penthouse offices about what went wrong.*

In 1998 Winstar was one of the two fastest growing NW200 companies, ratcheting revenue up 243% to $244 million. How did you go from that to Chapter 11 in such a short time?

Think about that ... 243% revenue growth. And what is the single biggest reason people say companies like ours failed? There wasn't enough broadband demand. We grew the following year to over $450 million, and to $760 million in 2000, and this year we would have been

See Winstar, page 60

PHOTO CHRISTOPHER WEIL

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100

Attacks cast pall over N+I show

■ **BY NETWORK WORLD STAFF**

ATLANTA — Despite efforts to present some sense of normalcy, the horrific terrorist attacks last week essentially rendered moot the NetWorld+Interop 2001 show.

The unfolding events sent people scrambling to secure ground transportation home and turned many exhibit booths into TV dens. On Tuesday, keynote addresses were canceled, the exhibit floor was closed early, and a host of vendors, including Microsoft, AT&T, Intel and *Network World's* parent company IDG, abandoned their booths to reunite employees with family.

In addition, a few press conferences, including BellSouth's storage and DSL announcement, were canceled.

Dwindling traffic at the show foiled some exhibitors' plans, including those of the 10 Gigabit Ethernet Alliance (10GEA), a vendor-neutral industry group that put on the first public multivendor demonstration of 10G switches and components (see story , page 12).

"I don't think the attendance at our booth represents the industry's interest in [10G Ethernet]

See Interop, page 12

INSIDE
MORE INTEROP NEWS

- 10G Ethernet interoperability goes on display. PAGE 12.
- Extreme airs application switches. PAGE 17.
- Yipes makes Ethernet services more flexible. PAGE 25.

More online!
Get all the news from the show in one place
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Nothing could be further from the truth. In times of economic downturn, it may seem prudent to put the whole e-Business issue on the backburner. But it's not. Tough times call for speed, nimbleness and agility more than ever. The time to get smart and implement e-Business solutions for your customers is today.

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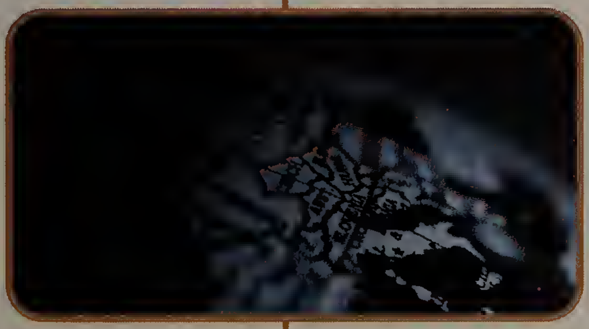
The Internet does not change everything. It doesn't change the business rules that run your company. Or the infrastructure you've spent years building. Or the nature of your business. Or your need to generate revenues and profit.

The Internet is obviously a critical part of any e-Business. But the Internet is only a common set of protocols for the transport of information. It's how well you manage that information that determines the success of your business.



IT'S A ONE-BRAND WORLD.

This myth surrounds just about every significant e-Business platform discussion. Virtually every purveyor of e-Business platforms touts their version of this "one-brand" world. Their brand, of course. Big surprise.

At Sybase, we know it's just not true. Countless brands compete, cooperate and commingle inside your company. It's laughable to pretend that any one external organization can "standardize" all the various protocols, systems, components, new technologies, languages, databases and vendor relationships that your business depends on to succeed.

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Portals and websites along with application servers, databases, customer relationship programs, automated supply chains, an efficiently connected field force and the rest of your back office are all vital components of an e-Business. It's making them work together that's the trick.

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NetworkWorld

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STEVEN LYONS

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Extending Ethernet

An IEEE study group calling itself Ethernet in the First Mile is hoping to develop a carrier-grade Ethernet that can compete against DSL, cable modem and SONET. **Page 37.**

Several upstart CLECs are offering Ethernet-based metropolitan-area network services. Here's who they are and what they're offering. **Page 39.**

Tester's Choice

Edwin Mier with the latest on soft phones for voice over IP. **Page 41.**

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Interactive

Attacked forum

A reader writes: "Thank you for giving us a site to vent and discuss our views on this time of mourning." **DocFinder: 6035**

Aftermath forum

Readers discuss the use of the Internet to stay in touch or find out about loved ones and colleagues. **DocFinder: 6036**

Verizon hit hard

Read about Verizon's Vice Chairman Larry Babbio's address to the media in a press conference in which he described Verizon's severe network damage and concerns about the company's personnel. **DocFinder: 6037**

Stories of survival

Read some of the news related to IT companies and the rush to help victims; stories of those that survived. Get links to all the breaking news since last Tuesday. **DocFinder: 6038**

Attack news complete coverage

DocFinder: 6039

Resources

Get links to Aid, disaster recovery, business and travel assistance. **DocFinder: 6040**

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Compendium

First-person accounts

Fusion Executive Editor Adam Gaffin compiles a list of online postings from people who survived or witnessed the World Trade Center attacks. **DocFinder: 6041**

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Wireless phones answer the call

Cool Tools columnist Keith Shaw comments on the role of cell phones and their most recent impact on American society. **DocFinder: 6042**

Onboard 911

Columnist James Kobielus says the government should require free, in-flight 911 as a hijacking countermeasure. **DocFinder: 6058**

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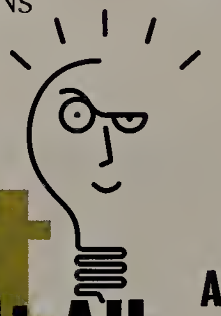
News Bits

Linux companies continue to struggle

■ There's more bad news for companies seeking to make a profit from the open source Linux operating system, as an embedded operating system maker announce layoffs, and a supplier of Linux-based server hardware file for bankruptcy protection. Lineo, which makes the Embedix operating system and RTXC development tool, will eliminate 60 jobs and "spin out" another 100 employees in peripheral activities, the company said.

The cuts will leave the Lindon, Utah, company with about 110 workers focused on "core" activities, including embedded systems for handheld devices, residential gateways, routers, VPNs and digital television. Lineo plans to divest peripheral activities to partners and third parties. Meanwhile, EBIZ Enterprises, which makes the Terian line of servers for the business market, announced last week it is filing for Chapter 11 bankruptcy protection. The company will file a reorganization plan with a Phoenix court "within the next couple of weeks," CEO Dave Shaw said in a letter to shareholders. EBIZ, based in Scottsdale, Ariz., has more than 80 employees. The company's subsidiary Jones Business Systems, which sells and services desktop Linux- and Unix-based platforms, also filed separately for bankruptcy protection.



Be a Net Know-It-All

■ **THIS WEEK'S QUESTION:**

Who was the IETF's first chair?

Answer this and nine additional questions online and you could win $500! Visit **Network World Fusion** and enter **2349** in the Search box.

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Mafiaboy sentenced

■ "Mafiaboy," the 17-year old Canadian responsible for a series of massive distributed denial-of-service attacks in February 2000, was sentenced to eight months detention by a Canadian judge in Quebec last week. Mafiaboy (Canadian law prevents the naming of underage offenders) had faced up to two years in prison and a fine of up to $650.

Mafiaboy's punishment actually consists of two consecutive four-month sentences. The sentence requires Mafiaboy to spend those eight months in open custody, essentially a strict reform school in which the population can gain privileges through good behavior. Mafiaboy will also be on probation for one year. The terms of the probation include that Mafiaboy must inform the Royal Canadian Mounted Police what ISP or other communication service he is using to access the Internet. Mafiaboy is also barred from owning any software that is not commercially available, from associating with cracker groups online or offline and from visiting hacking Web sites.

Ventro stock hits the skids

■ One-time high-flying business-to-business marketplace Ventro is under threat of being delisted from Nasdaq. The company isn't in compliance with the $1 minimum bid price requirement for Nasdaq listing. It is meeting with the Nasdaq Listing Qualifications Panel sometime next month to present a plan to regain compliance and request the stock to stay listed. Ventro was the pioneer of business-to-business marketplaces, running Chemdex and Promedix, but it ran into financial trouble and wound up closing these marketplaces. It has since transformed into an e-business application and platform provider for marketplaces.

■ The Good The Bad The Ugly

Yahoo responded to the needs of the American Red Cross, which had its Web site inundated by would-be blood and financial donors in the wake of last week's attacks, by volunteering computing resources that wound up handling 75% to 85% of the Web site's traffic.

Qwest Communications is supposed to be one of the few carriers still making hay while the rest of the industry tumbles. But it didn't look that way last week, when the company announced 4,000 layoffs and revised earnings expectations downward.

EBay formally banned the auction of items related to the World Trade Center and Pentagon attacks after listings for debris and other materials from the crime scenes were posted. Enough said.

Oracle does OK

■ Software giant Oracle reported better-than-expected first-quarter earnings last week, but tabled discussion of the results and management's outlook until the stock market reopens this week.

Oracle earned $510.6 million for its fiscal first quarter, ended Aug. 31, up 2% from $500.7 million in the year-ago quarter. With its software sales eroding, Oracle's revenue in the quarter dipped to $2.24 billion.

American Greetings snaps up competitor

■ American Greetings last week spent $35 million to acquire Blue Mountain Arts, the electronic greeting card arm of Internet access company At Home. The acquisition comes less than two years after At Home, which does business as Excite@Home, spent $780 million in cash and stock to buy Blue Mountain at the height of the dot-com boom.

American Greetings will add its former rival to its family of online greeting card providers, including AmericanGreetings.com, Egreetings.com and BeatGreets.com. The electronic greeting card firm spent $28.6 million to acquire the latter two Web properties this year.

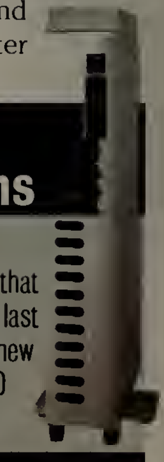
Kournikova creator faces judgment

■ Saying that people should be able to use computers and the Internet without interference, a Dutch public prosecutor on Thursday asked the court in Leeuwarden, Netherlands, to sentence the 20-year-old maker of the Anna Kournikova e-mail worm to 240 hours of civil service. The prosecutor also asked the court to not return the defendant's computer and a CD-ROM containing computer viruses.

The defendant, Jan de Wit, turned himself in to the police Feb. 14. A few days earlier, he had posted the e-mail worm to an Internet newsgroup and it spread worldwide. He was charged with spreading data via a computer network with the intent to cause damage. The fact that no damage claims have been filed with the prosecutor's office is one reason the prosecutor isn't asking for heavier sentencing.

However, the U.S. FBI said in a fax to the prosecutor that it has identified 55 victims of the worm with a total damage of $166,827. That claim wasn't specific enough, the prosecutor says. De Wit admits he created the program using a worm-making tool kit, but says he didn't foresee the consequences when he posted the virus. The verdict is expected Sept. 27.

Corrections



■ This is the photo that should have run with last week's story on the new EMC Symmetrix 8230 storage product.

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Attack

continued from page 1

"The cellular and phone systems are horrendous," says Phyllis Lampell, executive director of the Wall Street Technology Association, which is setting up a chat room on its Web site for its 1,200 members to offer each other data center space or other resources in the wake of the attacks. "I've had people trying me since [Tuesday] who can't get through, and I'm in New Jersey."

She adds: "The Internet seems to be fine, although I'm not getting tons of e-mail."

Still, news and airline Web sites, including those for CNN, ABC News and *The New York Times*, were overwhelmed by traffic volume during the first hours after the attacks. Content providers, though, had some success in increasing bandwidth with the help of hosting providers and content delivery network companies to better handle up to tenfold spikes in visitor traffic.

Though two-fifths of the Pentagon was damaged by the hijacked airliner slamming into it, the military's command and control communications remained intact, as did its classified and nonclassified intranets. The Pentagon's private phone system survived, though circuits to the outside world were often unavailable in the Washington area. The main problem, Pentagon officials say, was cellular.

"The [Defense Department] systems continue to function across the board, but the impact was on people trying to use cellular phones from Verizon, which are distributed to military personnel," says spokeswoman Sue Hansen, who survived the terrorist attack, though up to 200 others may have died at the Pentagon, according to last week's estimates.

Winstar Communications has been able to deploy fixed wireless radio equipment that is equivalent to four T-1 lines at the Pentagon, says Bill Rouhana Jr., CEO of Winstar. "We've been able to kludge a network together for them."

These fixed wireless lines are connecting rescue and emergency personal to Cingular Wireless' network. They are using wireless voice services to stay connected throughout the burned out area where workers are searching for victims.

Rouhana says that Sprint, the Federal Emergency Management Agency and New York City have all requested assistance from Winstar for everything from replacing T-3 lines to establishing emergency services.

At the World Trade Center towers, Morgan Stanley Dean Witter, the New York Port Authority, Lehman Brothers and others among the 1,200 businesses located there had extensive data centers and significant network installations on site. Many if not all of them will be forced to reevaluate their disaster-recovery plans in the weeks and months to come, though a number of them also indicated they were prepared to be open for business the day after the attack.

AP PHOTO/DAN LOPEZ

Last week's deadly terrorist attack on the Pentagon damaged about two-fifths of the Arlington, Va., structure, but classified and nonclassified data networks and phone system remained intact. The main network problem, government officials say, is that military personnel were unable to use their cell phones because of disruption and congestion on Verizon's cellular service.

"The firm is in great shape, all of our systems are working," Morgan Stanley CEO Philip Purcell told employees worldwide last Wednesday from the firm's headquarters on Broadway, encouraging them to relay that message to clients. However, Morgan Stanley, which had 3,500 people in the World Trade Center buildings, was reporting that up to 40 of its employees were missing as of late last week.

Investment firms last week were reluctant to provide details about their alternate systems, though disaster-recovery vendor SunGard Recovery Services disclosed that 15 customers have been affected so severely as to move into SunGard's sites, where they are provided with full telecommunications and computer equipment to duplicate their office needs. Another 70 customers alerted SunGard that they may need to use its services. Separately, disaster-recovery service provider Comdisco says 32 customers declared disaster emergencies.

Keeping the network up

Some businesses near New York's ground zero shared their experiences. SoundView Technology Group, an online investment banking firm in lower Manhattan, which was declared a disaster zone, kept its private data network operational for Internet access and e-mail services for 400 employees in New York, Stamford, Conn., and San Francisco. However, part of the company's voice network was cut off when the World Trade Center towers were hit.

SoundView had dedicated, private voice lines - called ring-down circuits - at all the major brokerage firms in New York, and most of those lines were down.

"With the ring-down circuits, you just pick up a line and you're talking to the broker," explains Bart Anthony Lavore, manager of corporate telecommunications for SoundView. "These are voice lines that can be copper or T-1 circuits that go straight to the brokerage house."

Lavore last week was trying to set up speed-dial lines between SoundView and the temporary locations of brokerage houses affected by the disaster. These speed-dial lines won't be as fast as the ring-down circuits and will cost more because they use the public telephone system, but at least they will provide connectivity, he says.

"We're still trying to figure out when we'll be able to set up the speed-dial lines," Lavore says. "[The carriers] haven't told us when there will be power restored to the three central office switches closest to the financial district."

Bill Moore, telecommunications manager at the Museum of Modern Art in midtown Manhattan, says the museum's network was largely unaffected, though Internet connectivity slowed. Still, he's concerned about how long it will take to rebuild the overall network infrastructure serving the city.

"My gut feeling is that it's going to take quite a long time and a very major effort before we get our communications infrastructure anywhere back to normal," says Moore, who is also an officer with the Communications Managers Association. "It's going to take months, knowing what's down in that area."

Here is how Moore described the communications infrastructure in lower Manhattan: "[It] is a maze of tunnels. Most of the [fiber-optic] cables run below ground from building to building in those tunnels. That area down there is where Manhattan narrows to a point, and everything converges down there. As the World Trade Center buildings collapsed, they collapsed down into those tunnels. And as they start doing the excavation down there, there are likely to be some tractor cuts, too."

Wall Street's main interconnection point is the heavily damaged Verizon West Street facility, which supported 200,000 voice lines and 3 million private lines prior to the Sept. 11 attack. Last week, top officials at the New York Stock Exchange (NYSE) and Nasdaq said the financial industry, with its extensive data-storage and back-up systems, would be ready to reopen the stock exchanges today - if Verizon's facility can be restored.

"Verizon is working mightily in this building, and there is great danger to workers," said Richard Grasso, chairman of the New York Stock Exchange, which like other exchanges is dependent on interconnected voice and data networks.

At a press conference last week, Grasso acknowledged that the financial industry — even though the U.S. banking and Federal Reserve networks were unaffected by the attacks — needs to come up with a better telecommunications infrastructure plan to respond to emergencies. "As an industry, after we've resolved the challenges of the moment, first and foremost taking care of this human side of the tragedy, we will partner with the Securities and Exchange Commission, the Federal Trade Commission and others and ask: What are the points of vulnerability? How do we improve security from both the physical and systemic standpoint?" he said.

Nasdaq Chairman Hardwick Simmons, who spoke alongside Grasso, said the stock exchanges

See Attack, page 10

Close calls

Two user organizations feel fortunate.

The Communications Managers Association had an event planned for last Wednesday in New York called "What Do You Do When the Lights Go Out? A Look at Power Protection & Risk Management."

The meeting was to be held from 8 a.m. to 3 p.m. at 59th Street and Park Avenue. Among the individuals on the agenda was a network executive who created a disaster recovery program for one of the major hospitals in New York.

Separately, the Wall Street Technology Association (WSTA) typically holds its events at Windows on the World, an exclusive restaurant on the 107th floor of One World Trade Center. In fact, WSTA Executive Director Phyllis Lampell was scheduled to be at the restaurant last Tuesday, but she was still at her office in Red Bank, N.J., when tragedy struck.

In a press release issued the next day, WSTA said it plans to move forward with its October and November events at "a new venue to be determined." WSTA's 1,200 members are IT executives at financial services firms in the New York area.

— **Carolyn Duffy Marsan**

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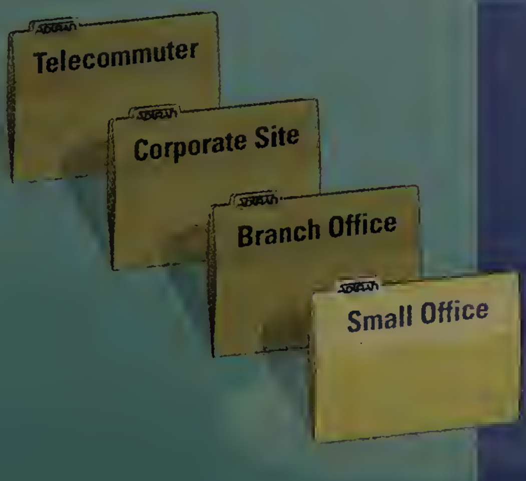

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Attack

continued from page 8

were in continuous discussion with Verizon executives and long-distance firms. For the financial services industry, "billions of messages per second are the business of this business," said Simmons, adding that there's concern Verizon can't yet handle the traffic volume it did before the attack.

Verizon had no easy answers to questions about why there was not more alternate routing. Despite using highly reliable technology such as SONET, the reality is that even SONET's dual-ring architecture can't help when both the fiber rings and the equipment attached to them are ruined. A Verizon spokesman says the carrier has already begun routing some calls to its Broad Street facility, which Verizon claims handles 80% of the NYSE and Nasdaq telecom needs (the West Street facility handles the rest). Meanwhile, repair work was proceeding under treacherous circumstances on both the outside of the facility, showered by heavy debris, and deep underground where water had seeped into cables running five stories deep.

"This could be a very long process," said Larry Babbio, vice chairman at Verizon, which had almost 500 employees at the World Trade Center, a small number of whom were unaccounted for at press time. "The building is filled with smoke and dust. It's difficult to breathe and to see."

"Thousands of circuits have been moved to get customers up and running," said Ivan Seidenberg, co-CEO and president an Verizon. As of Friday, the company had rerouted 24 OC-48 circuits, which is the equivalent to more than 20 million T-1 lines, according to Seidenberg.

Among service providers, Verizon's network appears to have been hit the hardest, and Verizon Wireless lost 10 cellular transmitter sites. But others also took major hits. Cingular lost six transmitter facilities in New York, while Sprint lost four cell sites in lower Manhattan.

AT&T lost landline connectivity to its wireless cell sites but reported that its local switching gear located several stories down in the basement of the World Trade Center remained unscathed. Still, AT&T says it rerouted calls. Qwest Communications and WorldCom say their networks were not affected by the attacks.

Internet trouble spots

While Internet-based communications fared well overall, ISPs weren't immune from network interruptions.

"It doesn't matter which ISP you have. There are only so many cable conduits under the city, and everyone buys lines from everyone else," says Perry Metzger, CEO of start-up Wasabi Systems, which is located on 14th Street, at the edge of the disaster zone. "All of the ISPs in New York have been having trouble."

Wasabi is a 20-person company that backs up its systems to a site in northern Virginia every four hours. But even with a disaster-recovery plan in place, it took more than 24 hours for the company to get its e-mail system and Web site running on spare systems in Virginia. In the meantime, the company's engineers located around the country couldn't communicate with each other or access corporate network resources.

Popular news sites were also overwhelmed, according to Keynote, a Web monitoring service, which reported that The New York Times, CNN and NBC News all had 0% availability between 9 and 10 a.m. last Tuesday, undoubtedly because of traffic overload.

"All hell broke loose," says Vice President of Technology at Washingtonpost.com Eric Schvimmer.

The number of page views was estimated to be running at 10 times normal, and the visual nature of the terrorism story meant Web site visitors, when they could get access to washingtonpost.com, were downloading high-bandwidth digital photos and audio. Schvimmer says the Web site, which collocates with Exodus Communications but also uses Akamai Technologies' content delivery services, had Akamai provide extra bandwidth under its FreeFlow service.

Exodus, which has four data centers in the New York metropolitan area and five in Washington, D.C., says that while its Web hosting service wasn't interrupted, company personnel was evacuated from the New York centers and a skeleton crew remained in the Washington facilities, which all were being monitored remotely.

Ellen Messmer, Carolyn Duffy Marsan, Denise Pappalardo, Jennifer Mears and Kathleen Ohlson contributed to this story.

Verizon's crucial central office

West Street houses one of Verizon's largest central office switching facilities, which was severely damaged in last week's terrorist attack. With the New York financial markets dependent on this facility, Verizon is scrambling to bring it back online.

Problems:

- Facility was struck by steel and debris from Building 7 in the Twin Towers complex.
- The five floors in the basement storing cables are full of water. Mechanisms used to keep water out of cables failed.
- Building is full of smoke/dust.
- Water surrounds the switches.
- No electricity.

Facility supports:

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Tragedy claims high-tech executives

The grim task of identifying the victims of last week's terrorist attack revealed that several executives from high-tech companies were among the dead.

Six executives were killed aboard hijacked airplanes that were used in the attack.

These victims included Daniel Lewin, 31, co-founder and CTO of Internet communication company Akamai Technologies, and Edmund Glazer, 41, CFO of California optical network company MRV Communications. Both were on board American Airlines Flight 11, which slammed into the north tower of the World Trade Center. Also on the flight was Phil Rosenzweig, 47, a director in Sun's software organization who had been with the company since 1991.

"Daniel Lewin, or Danny as we all knew him, was just a great guy," says Doug Cavit, CIO at McAfee.com, one of Akamai's first customers. "We're all poorer with him being gone."

James Hayden, 47, the CFO for Netegrity, which develops Web-access control software, was killed aboard United Airlines Flight 175 when terrorists crashed the plane into the World Trade Center's south tower. He was traveling to Los Angeles to speak at the Credit Suisse First Boston Software Conference in Dana Point, Calif. Netegrity CEO Barry Bycoff was supposed to be on the plane with Hayden but was delayed in traffic in Boston.

Mark Bingham, founder of The Bingham Group, a public relations firm specializing in wireless technology, was killed in the crash of United Flight 93 bound for San Francisco from Newark, N.J.

Bingham is believed to be part of a group of passengers who struggled with hijackers before the plane went down in Somerset County, about 80 miles southeast of Pittsburgh, short of its likely intended targets at either Camp David, Md., or the White House. Before the crash, Bingham phoned his mother to tell her that he loved her.

"Mark was a person of action and he would not stand by and let something like this happen," says Judy Curtis, a senior account manager at the company and the first person Bingham hired. "His friends here in San Francisco think someone like Mark would have tried to intervene and do something."

AKAMAI TECHNOLOGIES

Daniel Lewin: Friends mourn loss of Akamai executive.

Steven "Jake" Jacoby, the COO of Metrocall, a wireless messaging company, was killed aboard American Airlines Flight 77, which crashed into the Pentagon. He was en route from Washington, D.C., to Los Angeles to participate in the Personal Communication Industry Association conference and exhibition this week.

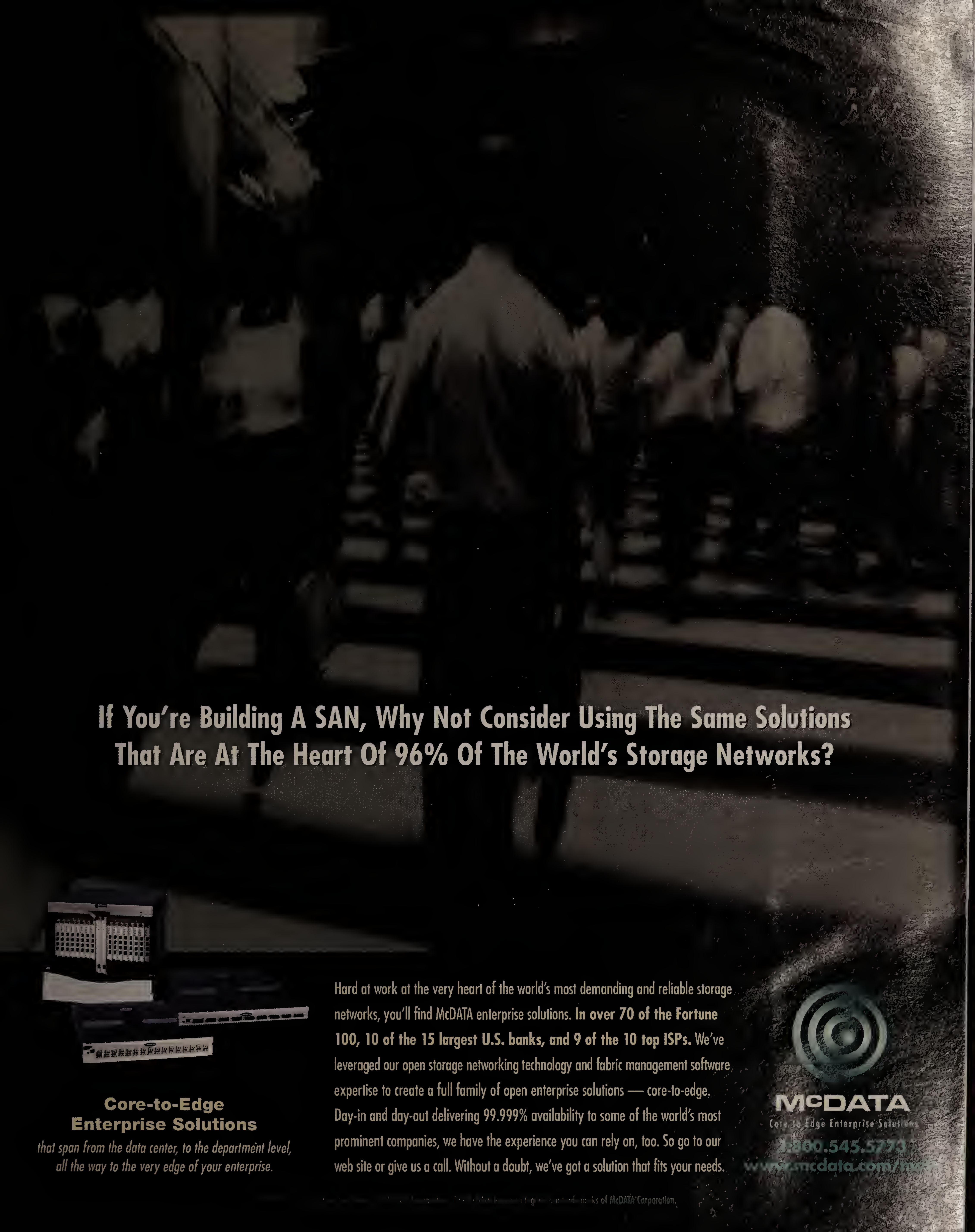
Also killed was Todd Beamer, 32, a sales manager with Oracle. Beamer, who had been with the company for seven years, was flying to California for a company meeting on Flight 93.

Suzanne Calley, 42, worked in strategic marketing for Cisco and was on board American Airlines Flight 77 that crashed into the Pentagon. She would have celebrated her 20th wedding anniversary the next day.

Also killed on Flight 11 were Jeffrey Coombs, 42, a security analyst for Compaq, and Jeff Mladenik, 43, interim president of Epsilon Logic, which develops COM/DCOM components and development tools. Also Christopher Zarba, 47, a software engineer at Concord Communications, died aboard American Airlines Flight 11.

— John Fontana

Network World *Senior Writer Jennifer Mears contributed to this report.*



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Interop

continued from page 1

technology," says Bob Grow, 10GEA chair and an Intel engineer."Lots of people have left due to the tragic events."

Show organizer Key3Media wouldn't release attendance figures, but the number was certainly less than the 50,000-plus the Atlanta show normally attracts each year. The economy didn't help either, as many cash-strapped companies curtailed travel.

"It is obvious to anyone that our attendance will have been affected. To what degree we don't know yet," says Rick Moore, senior vice president of communications at Key 3 Media Group.

"Obviously, it affects people, but there was no place really for people to go," Moore says. "We closed a little early on Tuesday because a lot of the vendors and attendees wanted to get on the phone, they needed some time to get a hold of family and friends

"There were keynoters that were stuck either in NY or California or whatever. There was some disruption and we had to juggle the keynoters around," he adds. "But I think for the most part, Wednesday morning, there was kind of resolve: 'You know what, this is not business as usual, but on the other hand we're not going to let something like this just totally cripple us.'"

One observer said there was some good foot traffic Wednesday through the Cisco and Extreme booths.

Novell also paid a heavy price. N+I was supposed to be the big coming-out party for the NetWare 6 Internet services platform, but showgoers were too preoccupied to pay much attention. The keynote by Novell Chairman Eric Schmidt was canceled (www.nwfusion.com, DocFinder: 6060).

EMMETT MARTIN

All eyes at the N+I trade show were on TVs reporting Tuesday's tragedy.

3Com was also counting on N+I to make a comeback of sorts after being absent from the last three major industry trade shows — NetWorld+Interop Las Vegas 2001 in May; ComNet 2001 in Washington, D.C., in January; and NetWorld+Interop 2000 in Atlanta.

But 3Com plowed ahead and announced several new offerings for its NBX LAN telephony system. The firm announced Unified Communications software for NBX, which can be used to integrate NBX's voice mail system with Microsoft Exchange or Lotus Notes e-mail servers. The Unified software will be available in the first quarter of 2002 for $125 per seat.

The company also announced IP Virtual Tie Line software for NBX, which lets users in separate offices make interoffice calls and transfer calls over an IP backbone by simply dialing an extension. The software starts at $3,000.

And finally, 3Com introduced a low-end IP phone with fewer features than previous NBX phones but at half the cost, at $285, as well as software for stitching together NBX voice-mail systems at separate sites into a logical system. The multisite voice mail software costs $8,000 per system.

Other products and services announced at the show include:

- The AT&T Managed Services Portal. The portal provides a wide range of real-time performance reports that customers can use to monitor hosted applications. Businesses can view usage levels on their Web sites and monitor daily network volumes. Pricing was not available.
- An enhanced version of Spirent SmartxDSL test device. The diagnostic tool measures key DSL network and network-device performance metrics, such as throughput, latency, packet loss and session establishment tests. Pricing starts at $4,000.
- Computer Associates' Unicenter Service Desk 5.5, formerly known as Unicenter TNG Advanced Help Desk. New with this release of the service desk software are wireless and mobile connectivity features. CA says net managers can now access tracking mechanisms and operational statistics in real time via Web and wireless devices. The firm also added trend-analysis support that will help users track problems over time and better meet service-level agreements.

IDG News Service contributed to this story.

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10 Gigabit Ethernet put to the test at NetWorld+Interop

Eighteen vendors of 10G Ethernet products contributed their wares for a demonstration of the technology at NetWorld+Interop 2001 in Atlanta last week, in an effort to show the network industry that prestandard 10G technology can successfully communicate.

The product test fest was hosted by the 10 Gigabit Ethernet Alliance (10GEA) industry group and was billed as more of a general product demonstration than a proving ground to show whose products worked and whose did not, so results on vendor-to-vendor interoperability were not released. Even so, demo organizers say the showing of 10G products proves to enterprise and carrier users that 10G bit/sec Ethernet is ready for deployment and that the technology's hefty price tag could drop soon, thanks to advancements being made in optical interface and 10G chip technologies.

EMMETT MARTIN

Interop served as the stage for 18 10G Ethernet companies to demo their wares.

Major Gigabit Ethernet switch vendors that participated in the demo included Avaya, Cisco, Extreme Networks, Foundry Networks and Nortel. All of these switch vendors have announced 10G products that are supposed to ship by year-end, except for Extreme, which has not yet specified a shipping date or price for its product. Component and testing equipment makers represented at the demonstration included Agilent Technologies, Broadcom and PMC-Sierra.

"The focus was getting the vendors to play together and to get traffic flowing," over 10G connections, says Bob Grow, chair of the 10GEA and an Intel engineer.

Instead of just connecting all the vendors' 10G switches together in one large 10G bit/sec mesh, the switches were set up in a mixture of topologies, with some switches aggregating multiple Gigabit connections and a few connecting to each other over 10G links.

Five of the seven vendors' switches in the demonstration were able to talk to each other over 10G links, according to Grow.

"This demo should give potential customers confidence in looking at technology — confidence that it's really Ethernet and it's really plug and play," Grow says.

Products demonstrated included Avaya's Cajun P550, Extreme's BlackDiamond, Cisco's Catalyst 6500, Foundry's NetIron and Nortel's PassPort 8600. All the boxes are currently shipping backbone switches that were fitted with 10G Ethernet blades.

One chip technology that showed successful interoperability was the 10G Attachment Unit Interface (XAUI) chipset. XAUI — pronounced "zowie" — is an alternative version of the 10G standard draft that specifies how optical transceivers and silicon on a 10G board communicate. Specifically, the technology outlines how to reduce the number of pins on the physical interface of a 10G module from 72 to 16 pins. While this may sound esoteric, "the more things you can pack onto a board, the cheaper it will be," Grow says. "The message here is that [XAUI] presents a path for driving down costs for 10 Gigabit Ethernet."

Grow estimates that XAUI technology could cause the per-port price of 10G Ethernet to drop by as much as 80% during the next few years. (Prices for announced 10 Gigabit products range from $20,000 to $80,000 per port.)

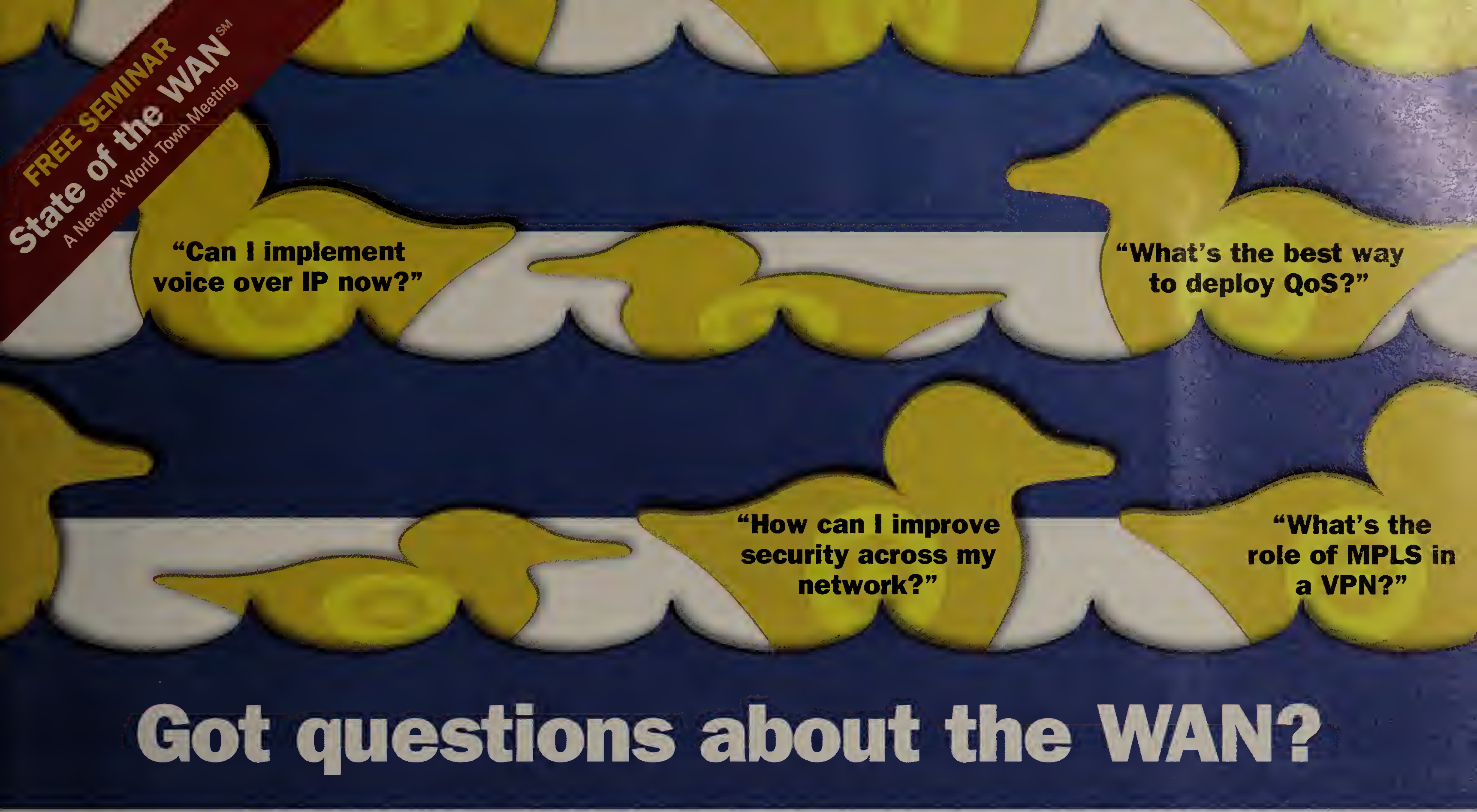
While many who observed the multivendor demonstration were impressed, according to Grow, other industry watchers say it will take more to spur widespread 10G adoption.

"Demonstrating interoperabiltiy is fine, but enterprise customers are going to need something to scare them into using it because there's no real reason to deploy it just yet," says Robin Layland, principal consultant at Layland Consulting in West Hartford, Conn. "Technology such as network-attached storage could drive users to 10G, it certainly could use the bandwidth."

And while advancements — such as XAUI — may help bring down 10G costs, other concerns about the technology still remain.

"10G Ethernet still needs a lot of the carrier-class technology built in to it, and my main question about it is when all that redundancy, etc., is finally in there, will 10G Ethernet still be inexpensive? At this point that's not clear," says Michael Walsh, president of the Frame Relay Forum.

— Phil Hochmuth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Project mgmt. key to CRM

Picking a vendor and installing its software only a piece of the puzzle.

■ **BY ANN BEDNARZ**

ORLANDO — Gartner's semi-annual customer relationship management summit lost much of its momentum when last week's terrorist attacks occurred, but not before analysts and users shared some CRM wisdom with the show's 567 attendees.

Scott Nelson, vice president and research director for Gartner's CRM group, opened his keynote address with a sobering statistic: More than 50% of CRM implementations are considered failures, a trend that will continue through 2006.

"The odds are, your CRM project will be a failure," Nelson told the attendees.

He cited the top 10 causes of CRM failure, including poor-quality customer data; limited customer input; lack of coordination among departmentwide initiatives; and sales incentives that are tied to old objectives.

The message: Lack of a comprehensive strategy is what derails many CRM efforts.

Mark Meyer, director of CRM at BMC Software, agrees. His company twice failed to get Siebel's field-sales application up and running smoothly. The CRM team didn't involve users, fed bad data into the system, didn't do adequate work to analyze business processes, and didn't get the support of sales management, Meyer said.

Elusive success

Through 2006, more than

50%

of all CRM implementations will be viewed as failures from the customer point of view, Gartner predicts.

When it tried a third time to roll out Siebel's applications, BMC faced significant resistance from users. If you mentioned Siebel to the sales team, "immediately dartboards began to materialize on your shirt," Meyer told attendees.

Meyer and his team worked hard to earn the sales team's support in BMC's third attempt — which was successful. If he had to do it over again, Meyer said he would double the time spent with executive management and do more return-on-investment analysis.

Melissa Johnson, senior vice president and CIO of Sterling Commerce, shared the lessons she learned in preparing to upgrade her company's Vantive applications to the PeopleSoft 8 suite.

First and foremost, Johnson advocates a plain vanilla implementation.

"Do everything in your power to convince the business not to customize," she said. Johnson also stressed the need for accurate customer data and business partner training.

In a session on project implementation, Gartner Research Director Walter Janowski spoke about the importance of arming your CRM project team with adequate resources. He shared some advice on assembling the right CRM team:

- Include the finance department. "Make friends with Finance," Janowski said. It helps to have someone with financial clout backing the CRM project from the start.
- Look for outside assistance. Most firms can't do a complex CRM implementation with only internal expertise.
- Keep project management internal. While outside consultants are helpful for advising and assisting, Janowski recommends looking in-house to fill project manager positions.
- Don't underestimate the importance of accurate database content.

Janowski also said to be wary of vendors offering big discounts if you buy all of your software licenses upfront. If you know the majority of users won't use the software until an 18-month implementation is complete, why buy now? You'll be paying maintenance and support fees for unopened licenses, and an upgraded version may be available by the time users are ready to use the software, he said. ■

VPN security requirements debated

Data can be compromised if partner's network is unsafe.

■ **BY SANDRA GITTLEN**

Debates about the security of IP VPNs rage on throughout the industry, but many large VPN users are most worried about what happens to their traffic when it reaches a recipient's network.

Where an IP tunnel terminates is as critical as the overall connection itself, according to Jim Metzler, founder of Ashton, Metzler and Associates and moderator of *Network World's* multi-city State of the WAN tour.

Data can be greatly compromised if an IP tunnel dumps off into an insecure part of another company's network, he says. For instance, if you connect to a partner that passes your traffic straight through to its network without holding the traffic in a "demilitarized zone," then your information could be in jeopardy.

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DocFinder: 6043

For Walter Nieczyporowski, a network specialist at the Bank of Montreal in Toronto, this is unacceptable. His company goes to great lengths to check out the specifications at the other end of any planned IP tunnel ahead of time.

"We want to know what's at the other end. We don't want to create a tunnel if they are exposed to the 'Net on the other side," he says. Nieczyporowski and his team, as well as the bank's information security experts, work closely with customers, such as big oil companies, that want to establish private connections with the bank.

The team makes sure there is no direct connection between the end of an IP tunnel and the destination site's corporate network. If the information security team does not feel comfortable with the setup, it will deny the request to create a link.

A director of communications technology at a large pharmaceutical company, who asked not to be named, takes this a step further. His company's legal team requires all customers and partners linking in through IP VPNs to sign a liability document.

"We're sharing drug plans with other companies, doing e-commerce," he says. "It's more than just needing firewalls on either side."

Then, an audit begins. The company hands over its guidelines for partnering, including a proposed architecture for the drop-off point. "There are always some companies that want to throw you into a router with an [access control list] on it. That's not allowable," he says.

There are no shared ports allowed in this plan. In fact, a partner needs to have a router running VPN software in a DMZ with a separate network card for just that traffic, he says. The pharmaceutical company also scrutinizes the partner's security policies, including who has access to the network.

"We aren't going to just plug into a company because they say they have a VPN. VPNs don't mean the same thing to all people," he says. "That's why we're clear about our requirements."

The director acknowledges that not all partners have this technology in place, and he dispatches his team to help set up the preferred drop-off point, if needed. Sometimes, the company will even fund the upgrade if the partnership is critical. ■

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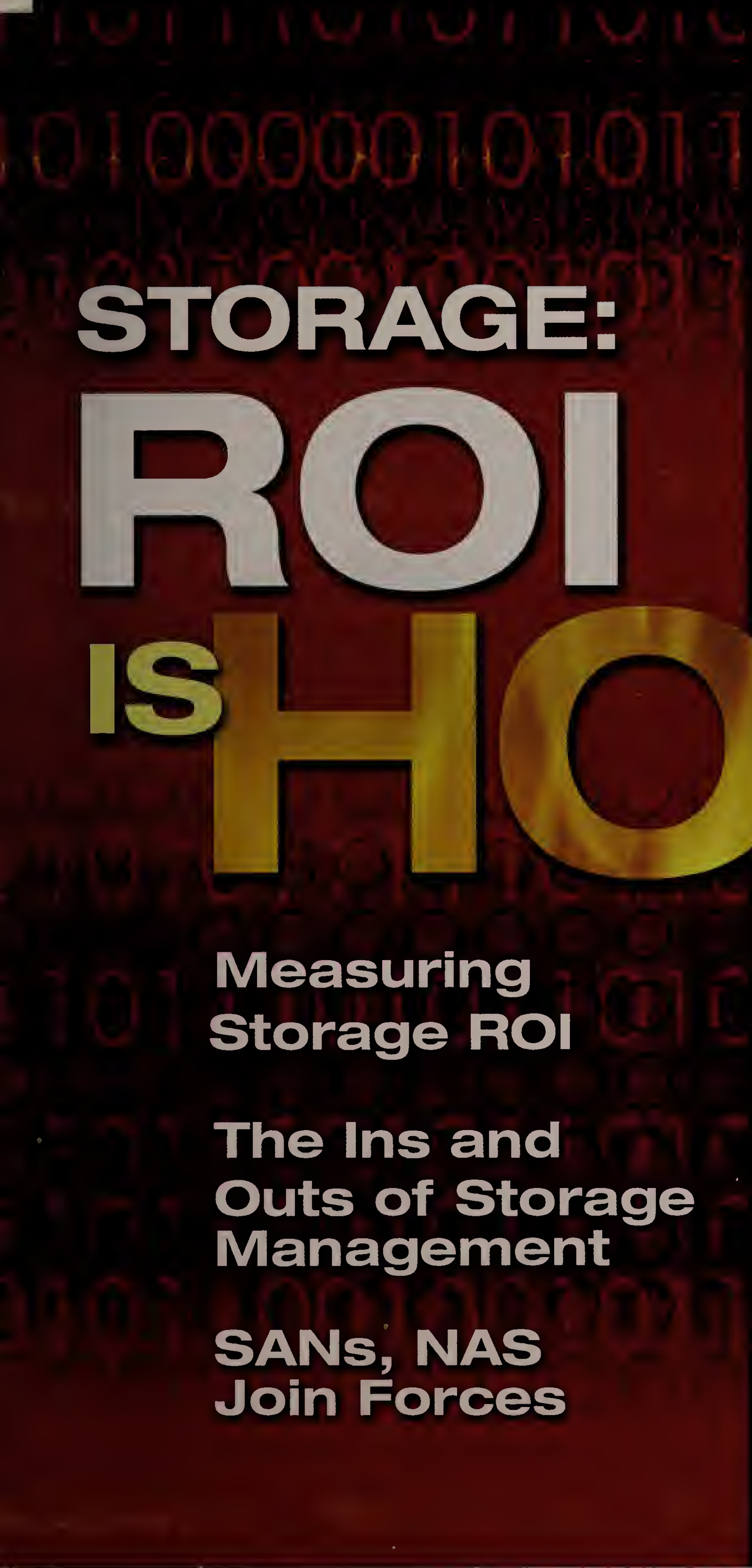

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Storage ROI:
Gaining Order From Chaos

According to a recent study, all the digitized data on the planet since the beginning of time will double within two years. After that, you can expect a twofold increase every 12 to 18 months. The average "Data 2000" company (the largest 2000 storage users) will double its online capacity demands every 8½ months.

Small wonder that IT professionals are preoccupied with storage matters these days. Storage is the cornerstone of all we do in IT—after all, it's the zeros and ones we generate, manipulate, and try to manage that can mean the difference between business success and failure.

IT departments are in the throes of a true crisis—keeping up with ever-increasing demand for storage while money and personnel are at a premium. These IT departments are asked to perform herculean tasks on a daily basis, all the while knowing the next wave of growth is right around the corner.

Beginning September 25 in Washington, D.C., I will moderate a series of Network World Town Meetings that address how investing in storage networks can help IT professionals manage and leverage the increasing volume of corporate data—the lifeblood of the business.

In these sessions, industry leaders will present current technologies designed to allow you to do more with less—a critical ingredient for success. These Town Meetings will show you what is real and what is promised, and how you can you solve today's problems with current technology—solutions that will continue to provide ROI down the road.

As an attendee, you will have the opportunity to ask me and other industry representatives hard questions, specific to your needs. Together we'll try to unravel the mystery of where the storage world is headed.

For more information on the Town Meetings, click on www.networkworld.com/seminars/storage. Meanwhile, crack the pages of this supplement, "Storage ROI is Hot," and begin your journey of harnessing order and direction from chaos.

—Steve Duplessie
Founder/Senior Analyst, The Enterprise Storage Group Inc.
www.enterprisestoragegroup.com

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ROI

Network connections

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Value Versus Potential

BY RICK STURM

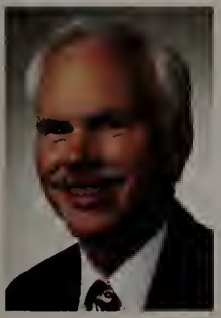
Network storage TCO and ROI are critical, but don't lose sight of the long-term payback.

Information growth knows no boundaries. and is impervious to economic ups and downs. Managing the staggering growth of digital information and the associated infrastructure in times of economic slowdown poses quite a challenge. Network storage architectures promise to help. The challenge for IT management is determining the value of these new technologies.

Today, harassed IT managers are taking a closer look at storage strategies and investments. Measures such as total cost of ownership (TCO) and return on investment (ROI) have become standard requirements in all storage proposals. In fact, preliminary results of a recent study by Enterprise Management Associates, co-sponsored by Network World, show that the predominant measure used to track expectations of network storage solutions is TCO. Companies are requiring the entire solution—storage, storage infrastructure, and management—to bring significant value to their environments.

Dividends Ahead

At a time when the business value of technology reigns supreme, companies may be hesitant to invest in network storage. But investing in a network storage architecture brings significant value to the problem of ever-expanding backup windows by allowing the data to be moved from primary storage to secondary storage and even tertiary storage, without impacting data accessibility. "The predominant value of network storage, as seen by IT management today, is the consolidation of data to increase availability and reliability as well as improve backup and recovery performance," states Anne Skamarock, senior analyst with Enterprise Management Associates, and lead analyst on the latest study.



RICK STURM

An investment in today's accessibility solution will evolve into tomorrow's manageability solution. Through industry organizations such as the Storage Networking Industry Association (SNIA), vendors are working aggressively to further the scope of the network storage solution. On the horizon are solutions that further the efficacy of consolidated storage. It won't be long before IT organizations will be able to use the capacity they currently own more effectively, across applications and even departments.

Through the use of virtualization techniques and policy-driven procurement software, storage will be allocated on the basis of its capabilities relative to application criteria, rather than what happens to be sold with the application server. Furthermore, the very near future will bring the consolidation of network-attached storage (NAS) file data and block data using a common IP storage network infrastructure.

IT management continues to watch costs closely. However, if management only views storage as a cost center, they will certainly miss an opportunity. With network storage, organizations will be able to leverage continuing significant return on their investments through the technological generations on the horizon. ■

Rick Sturm is president of Enterprise Management Associates, Boulder, Colo. His most recent book is "Foundations of Service Level Management" (Sams, 2000). E-mail him at sturm@enterprisemanagement.com.

How to Measure Storage ROI

BY JAMIE GRUENER

The current economy has greatly impacted how IT executives deploy new technologies. Yet, even though there might be less money or a freeze on IT spending in many areas, storage demands continue to grow, forcing IT to juggle expenses to keep up with exploding business data. IT executives today have more to worry about than just where they will store data generated by business. They must closely track costs and determine how to measure return on investment (ROI).

A May 2001 report from Gartner/Dataquest, a market research firm headquartered in Stamford, Conn., shows external storage growing at a 104 percent compound annual rate, to over 3.8 million Terabytes in 2005. These two issues combined mean a new focus on storage ROI to support conservative storage purchases—quite a rapid turnaround from recent years when IT infrastructure spending expanded at a rapid clip, according to storage industry watchers.

IN THIS ARTICLE

- Justifying Storage Expenditures Through ROI
- Cutting Costs With Storage Networking
- Making a Business Case for Storage
- Turning Storage Into a Service

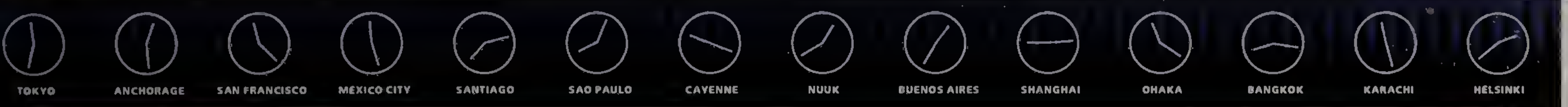
“What's different? We are talking about ROI now,” says Nick Allen, vice president and research director of storage research at Gartner Group. “Storage used to be a secondary thing. But now businesses are having to deal with rapid growth as well as justifying expenses.”

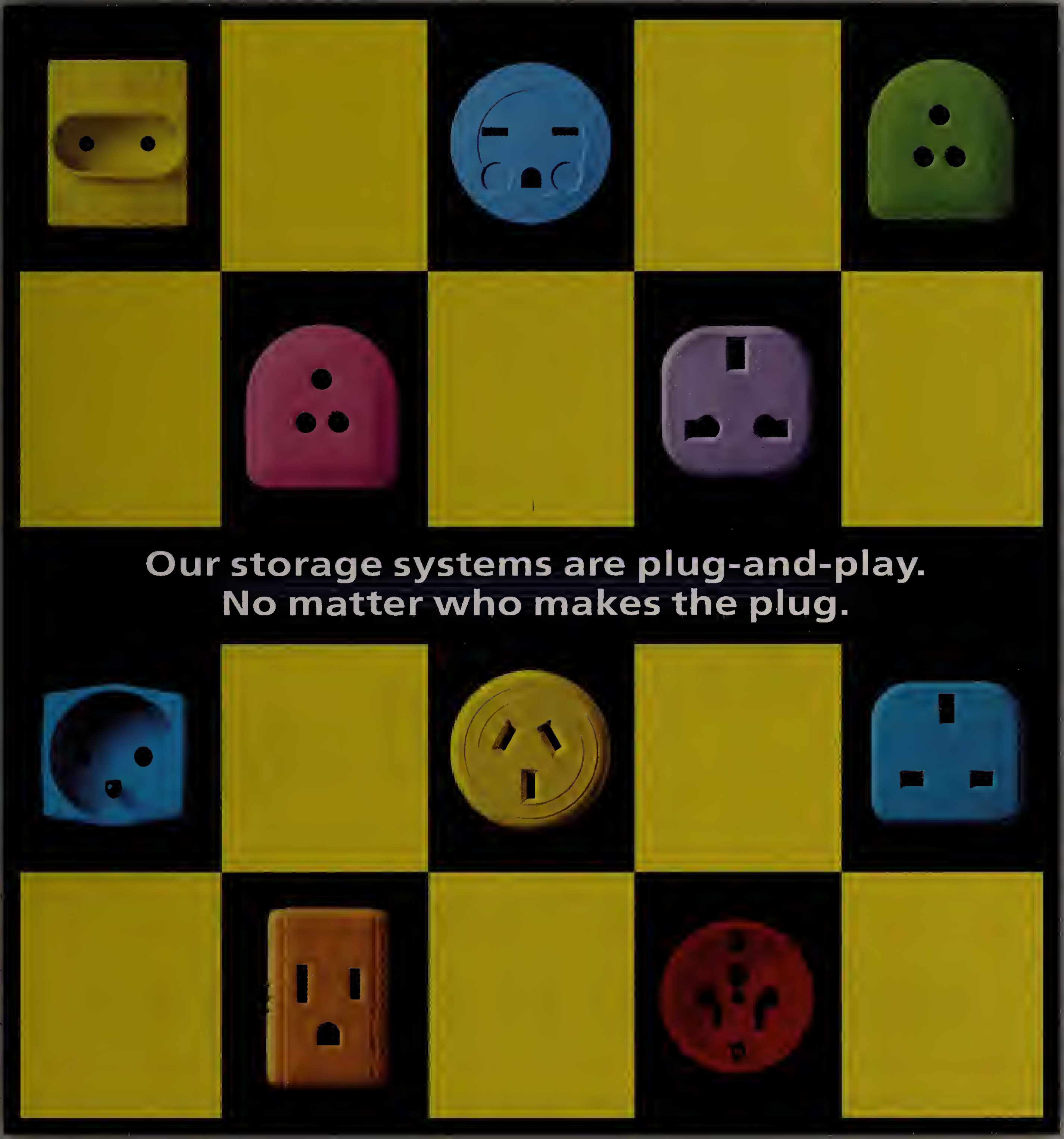
David Graham, worldwide IT operations director at Vignette Corp., Austin, Texas, has noticed the difference over the last year. Vignette, an e-business software company, has two data centers where storage is a priority and key to business operations. Graham has taken steps to assess what storage systems are in place, and how those systems are being used by business operations to achieve business goals.

During these **lean economic times,** corporate technology **purchases** are being increasingly **scrutinized** for their **return on investment.** Storage is no exception.

“Before, most companies were looking to grab market share,” says Graham. “Now you have to pay more attention to your run rates and expense lines. The focus is to run the business more efficiently.”

Graham and other IT executives are looking at ways to measure their IT efficiencies, including ROI. Traditionally, ROI has meant “cost savings,” calculated as total savings and/or return divided by total cost. The gotcha for IT executives becomes





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CALCULATING ROI

John McArthur, vice president of worldwide storage research at International Data Corp. (IDC), and other analysts suggest there are a number of measurements that go into calculating ROI of existing and new storage technologies. The following are some of the factors they recommend:

- ✓ **Determine the best approach to a storage problem: a high capital expense for a scalable and reliable storage system, or a cheaper and less scalable system.**
- ✓ **What are the people costs associated with managing storage? Could investing in better storage management tools reduce those costs?**
- ✓ **What will a storage investment do to improve application and operations availability, and how do organizations measure that improved uptime?**
- ✓ **Will adopting new storage systems or technologies lead to business profits?**
- ✓ **How does a storage investment help business? (An example is getting products to market faster.)**
- ✓ **Will outsourcing storage or storage management through a Storage Service Provider (SSP) be more cost-effective than deploying a new storage infrastructure?**

what costs and other measurements need to be factored into quantifying these savings. The first step is to determine how much the IT organization is spending on storage, and how much of the storage systems are being used. Many times this can be a linchpin in tight economic times.

"People are deferring decisions because they haven't done an ROI," says John McArthur, vice president of worldwide storage research at International Data Corp. (IDC), Framingham, Mass. "You need to know what your current costs are. Lots of companies don't know how much storage they really have," he says.

Justifying storage expenditures through ROI analyses can be largely subjective and based on individual IT spending practices, according to industry observers. But ROI does help IT executives get a better handle on their storage environments, and what will be needed to scale for the future.

Adopting new storage architectures such as storage area networks (SANs), network-attached storage (NAS), or storage resource management (SRM) can provide large-scale ROI. But customers need to do their homework before investing.

Allen says Gartner's advice to customers is "understand your true total cost of investment before locking into a value-added technology. Don't focus on purchase price alone. Realize how much this is costing you in the long run."

Other analysts offer a graver assessment of ROI, questioning whether it can really be considered a true IT cost analysis because of its subjective nature.

"Any attempts to calculate ROI are arbitrary," says Phil Goodwin, program manager of storage research, Meta Group, based in Stamford, Conn. "Senior management knows it is impossible to calculate. It becomes a gating mechanism to IT expenditures."

Storage Networking Can Cut Costs

As IT executives examine storage spending, storage networking is increasingly seen as a way to boost IT cost-effectiveness while providing competitive advantage. The movement toward SANs and NAS has already begun. Gartner Group predicts most server storage will be external and networked by 2005.

There is also mounting evidence to suggest that deploying storage networking (either SAN or NAS) can in fact boost companies' ROI by cutting a number of key costs associated with storage—especially storage management and personnel.

Industry watcher Enterprise Storage Group, Milford, Mass., suggests that the cost of moving from a non-networked storage infrastructure to a network storage infrastructure will have a dramatic ROI. In a recent study of IT executives, Enterprise Storage Group found that for those who have implemented a SAN, the average amount of storage they felt their personnel could manage is 3.7 times greater than what they could manage with a distributed direct-attached storage environment. A storage network-based environment also opens the door to deploying better storage management tools.

"If you are going to make an investment in anything this year, make an investment in storage resource management," says IDC's McArthur.

Others suggest that in addition to cutting storage management costs, organizations could significantly improve their business operations. In this era of the Internet, where networking rules and data availability is crucial, imagine being better able to handle e-business transactions, customer relationship data,

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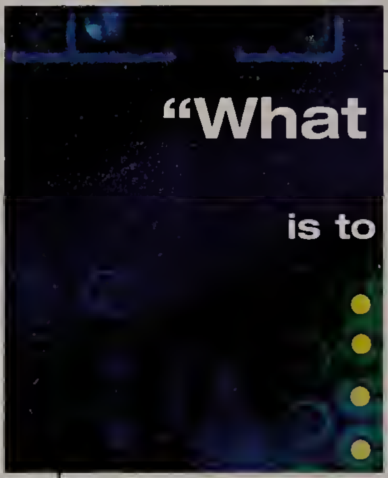


“What distinguishes companies from one another is the information they have and how they make use of it. **The Holy Grail is to make any information accessible** to any user, anytime, anyplace.”

–Dan Tanner, senior analyst, storage and storage networking research, Aberdeen Group, Boston

and other mission-critical data types. That could lead to faster time to market for new products, more responsive customer service, and increased transaction volumes supported on enterprise systems. Other studies and customer experiences support these assertions.

A July 2001 ROI study by KPMG Consulting Inc., McLean, Va., and sponsored by Brocade Communication Systems, San Jose, Calif., affirms the cost benefits of investing in a SAN. KPMG evaluated two customers' experiences in moving to a SAN environment: Federal Express and Intuit. In both customer sites SANs provided reduced capital expenditures, increased IT staff efficiency, improved system and application availability, and enhanced ability to efficiently exploit the full value of a company's information assets.

With Brocade's assistance, Intuit Inc., Mountain View, Calif., a maker of personal finance, small business accounting, and tax preparation software, began deploying a SAN in 1999 that has grown to provide storage services to most of the company's departments. The deployment has provided cost savings in a number of ways, especially in personnel and management costs. Intuit has used the SAN to gain competitive advantage through the products and services it provides, according to Peter Philp, senior systems manager for storage and backup in the company's technology operations. Intuit has been able to improve the scope of services it can offer over the Internet, including real-time stock quotes, filing of tax returns, online collaboration between tax accountants and clients to share information, and other online offerings.

“Every one of these things is on a shared storage array that is backed up and restored on a SAN. It has completely changed our business,” says Philp. “It makes our customers more efficient in what they can do online and gives them a higher level of data integrity and security.”

One thing is clear: Storage networking can provide competitive advantage by making data more accessible, regardless of the medium and application.

“All you really care about is the data,” says Dan Tanner, senior analyst for storage and storage networking research at Aberdeen Group, Boston. “What distinguishes companies from one another is the information they have and how they make use of it. The Holy Grail is to make any information accessible to any user, anytime, anyplace.”

The Business Case for Storage

So, you have done your ROI analysis, formulated a budget, and drawn up a strategic plan for your future storage expenditures. Not so fast. You might want to consider ways to bolster your business case for storage.

Traditionally, storage hasn't been sexy. But the battle to make a business case for storage is getting easier as the recognition for the value of data grows, according to industry analysts.

“Everyone buys into the thought that information is valuable,” says Meta Group's Goodwin. A good example is customer resource management applications. “They know they have programs and applications that generate data.”

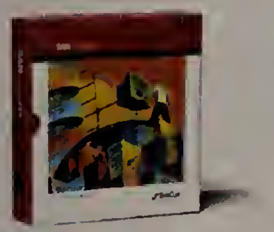
Knowing how to market the value of managing and storing this data for both IT and business operations will increasingly be key to ensuring that the storage budget is fully funded. It all comes down to IT's interdependency with business.

“What IT needs to do is relate infrastructure back to a business operation,” says Goodwin. “It is easier to associate revenue with an infrastructure. And it draws the business manager into the management of that infrastructure.”

The advent of SSPs has also changed the value of storage by making it a service. For enterprises, storage could also be viewed as a service for users and departments—a repository for crucial data. Then IT executives can better track the use of storage by department, and build strategies that take into consideration changing departmental needs for storage. Service-level agreements with departments could also be leveraged for budgetary responsibility.

“Many storage cost centers could turn into profit centers,” says IDC's McArthur. “They become a competitive service bureau to their company and eventually offer the service to other companies.” ■

Jamie Gruener is a former freelance writer and consultant who recently joined Boston-based market research firm Yankee Group as a senior analyst covering storage.



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Joining Forces

Combine SAN and NAS storage architectures to suit business needs.

BY LAUREN GIBBONS PAUL

Like bookends, storage area networks (SANs) and network-attached storage (NAS) sit on both ends of the storage spectrum. SANs are primarily suited for high-speed, block-level backup whereas NAS is for flexible file access.

Although NAS and SAN differ significantly, they are not mutually exclusive. In fact, a large enterprise might need to use both types of storage, depending on the applications and storage needs. "SANs and NAS perform two different functions; they are complementary," says Zachary Shess, senior analyst, storage and storage management, in the Palo Alto, Calif., office of Aberdeen Group Inc., a Boston consulting firm. "A SAN cannot solve all your [storage] problems, and neither can NAS."

Whether a company elects SANs or NAS—or both—as its storage architecture of choice depends on the type of data to be stored, how often it needs to be accessed or restored, and whether users need to share files stored on the device.

SANs Ideal for Backup, OLTP

IT managers deploy SANs where they need a high-speed, dedicated path from server to storage device, independent of the LAN, and where they want to share storage with servers. Shess points to backup as an ideal application for a SAN; for example, companies cannot run huge backup jobs during the day while the business is operating. And for global companies operating 24x7, backup becomes an even bigger issue. "So it makes sense for these companies to run their backup jobs on a SAN. It doesn't slow down the network," says Shess.

SANs use the Fibre Channel interconnection protocol, which allows data transmission speeds of up to 1G bit/second—much faster than traditional SCSI-based PC and server devices (which have a maximum speed of 160M bits/second). This makes SANs particularly well suited for applications such as online transaction processing (OLTP) and streaming media.

IN THIS ARTICLE

NAS/SAN Combo Meets Enterprise Needs

2DDs the Next Storage Wave

The downside is that because SANs are a network unto themselves, separate from the LAN, they can be costly and time-consuming to deploy, says Shess. The total price tag varies widely. Depending on the combination of switches, storage devices, and software needed, the cost can run into millions of dollars. Rollouts can take a year or more.

NAS, by contrast, is cheaper, quicker, and easier to deploy. Unlike SANs, which were architected to move large blocks of data, the primary purpose of NAS is to serve files. So it is suited to file-oriented environments where access is the key consideration.

NAS was designed to increase file-access performance and support large amounts of storage, says Anne Skamarock, senior analyst at Enterprise Management Associates, a consulting company in Boulder, Colo. NAS file servers, called "filers" or "appliances," are quick to configure, usually requiring only 10 minutes

Continued on page 18

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AT A GLANCE

NAS

(network-attached storage)

- ✓ NAS filers, or "appliances," attach to a LAN and deliver files to client systems via the LAN.
- ✓ Clients running different operating systems can share NAS files.
- ✓ NAS filers do not share storage with other servers.
- ✓ Suited to file-level (as opposed to block-level) I/O (such as for file-sharing).

SAN

(storage area network)

- ✓ Based on Fibre Channel.
- ✓ SAN storage connects to multiple servers through a separate network, not via the LAN.
- ✓ Servers access SAN files using block I/O commands, not by calling files.
- ✓ SANs do share storage with other servers.
- ✓ Suited to block-level I/O (such as for high-speed backup) and bandwidth-intensive backup environments.

Source: Aberdeen Group Inc.

Continued from page 14

to install into an existing network.

Steve Rin was skeptical about the claim that he could be up and running with a NAS appliance in minutes. A database administrator for Indian Motorcycle Co., based in Gilroy, Calif., Rin was planning to upgrade his Sun server to manage database growth of 20G to 40G bytes per week. But after a trip to the labs at Network Appliance Inc., he discovered the company's F840 NetCache Filer would let him back up his company's 90G-byte Oracle database in five minutes without bringing down the system, a task that had taken hours before. Indian Motorcycle invested $250,000 in a NAS system last February.

Rather than upgrading to an expensive new server, "NAS storage allows us to use our current servers and just attach the disks that we need. It extends the life of our hardware," says Rin. Indian Motorcycle recently bought 20 18G-byte disks and plans to add four more 36G-byte disks soon. The appliance also allows file sharing between Indian's Unix and NT environments.

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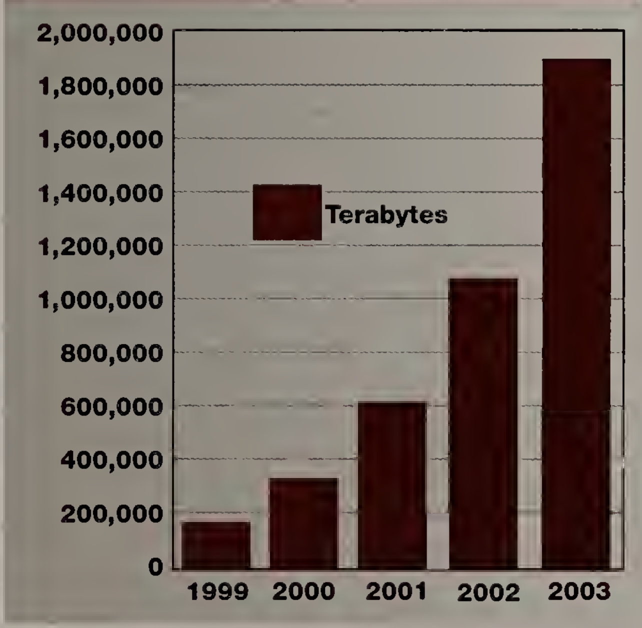

Source: International Data Corp.

International Data Corp. projects an 80 percent compound annual growth rate in data from 1999 to 2003, with a market size of $46.4 million.

Two-Dialect Devices

The next wave of storage, according to Skamarock, are storage devices that merge NAS and SANs. Aberdeen's Dan Tanner, senior analyst, storage and storage networking research, refers to these as "two-dialect devices," or 2DDs. These hybrid devices combine the file-oriented structure of NAS with the block-oriented nature of SAN data, giving users the ability to choose the highest-performance path—whether SAN or NAS—for specific file backups. "Vendors are beginning to realize companies need both types of storage," says Shess. Indeed, several companies already offer storage devices that contain both approaches.

In simple terms, a 2DD would be "a specialized NAS server that can access data off a SAN," adds Skamarock. According to Tanner, at their best, 2DDs have SAN attributes. For example, they can carry out high-speed block I/O transfers between servers and storage; provide a high-speed data path for bulk I/O transfers; and consolidate server storage. They also have NAS characteristics, such as the ability to deliver files over a LAN and share files across heterogeneous platforms. While no vendor currently has a solution that so perfectly spans both types of storage, it's just a matter of time, says Tanner. ■

Lauren Gibbons Paul is a Waban, Mass., writer who covers storage and networking issues. E-mail her at laurenpaul@mediaone.net.

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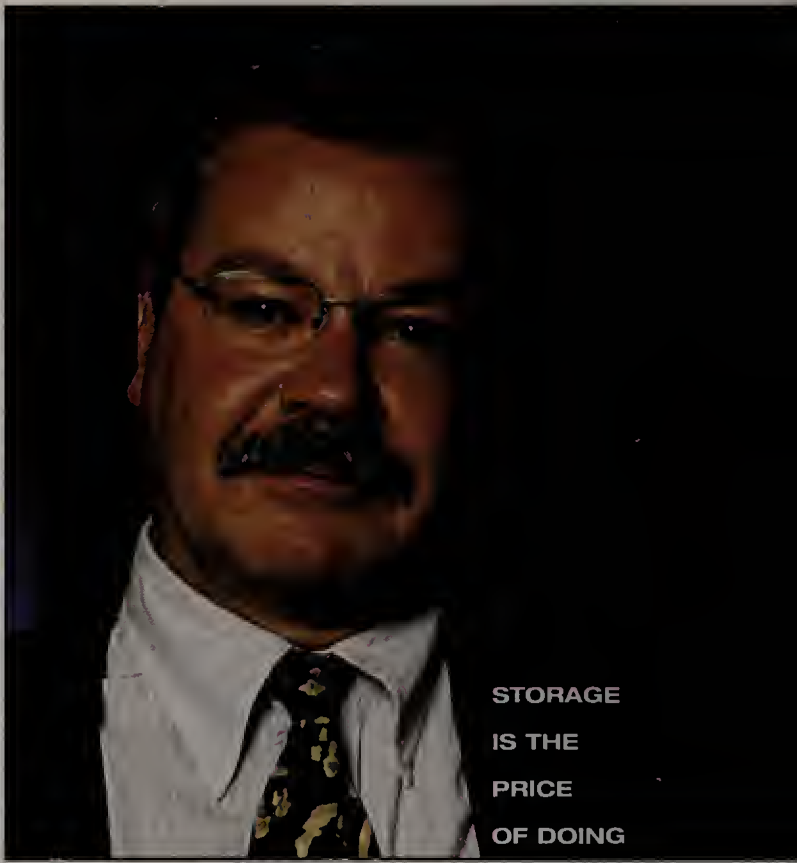
Storage can represent both a revenue-generator and a way to save costs, as companies like Galileo International and FreeMarkets demonstrate.

A Tale of Two Users

BY ALAN RADDING

Galileo International Ties Revenue to Network Storage Systems



ERIC LARS BAKKE/MERCURY PICTURES

STORAGE IS THE PRICE OF DOING BUSINESS, SAYS FRANK AUER, GALILEO INTERNATIONAL.

Frank Auer doesn't feel compelled to formally justify Galileo International Inc.'s huge investment in storage. With 102 Terabytes of storage capacity, storage certainly plays a big role at the 30-year-old global travel information services provider and consumes a massive chunk of the overall systems budget. Why no formal ROI analysis? Simple. Every penny of Galileo's $1.6 billion in 2000 revenue is tied to its data storage.

"We don't make a physical product. Our information systems are the engine that makes us money. Every bit of revenue we make runs through our systems and storage," explains Auer, vice president of systems and operations. Headquartered in Rosemont, Ill., Galileo provides travel information to, and processes reservations for, 43,000 travel agents in 109 countries. Even its plans for new revenue-generating offerings are tied to storage by providing faster, easier, and more complete access to the information already stored in its systems.

IN THIS ARTICLE

- Making Storage Central to the Business Plan
- Generating Revenue via Network Storage
- Maximizing Storage Cuts Costs

Galileo operates two computerized reservation systems located in Denver: Its Apollo system is marketed in Canada, the United States, Mexico, Japan, and certain islands in the Caribbean, while its Galileo system handles the rest of the world. The company estimates that about one-third of all automated travel reservations worldwide are booked through its systems, which contain schedule, fare, and reservation information from 500 airlines as well as information on more than 47,000 hotel properties and 37 car rental companies. The systems, which operate around the clock, processed more than 345 million bookings in 2000. During peak periods the systems handle 10,000 requests per second.

The Galileo data center encompasses 21 enterprise systems servers with a combined processing capacity approaching 5,800 MIPS (millions of instructions per second). These are classic mainframe systems running a specialized travel industry platform called Transaction Processing Facility (TPF), which provides real-time, high-volume transaction processing capability and forms the hub

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> **"Every bit of revenue we make runs through our systems and storage."**
>
> *—Frank Auer, VP, systems and operations, Galileo International Inc.*

of the operation. In addition, Galileo runs Virtual Machine (VM) operating platforms for software development and testing, and OS/390 enterprise servers that handle hotel room, auto rental, and other services and communications management functions.

In addition to this classic mainframe environment, Galileo runs an extensive open systems environment consisting of numerous Unix and Windows NT systems. This is where most of the new action is focused today. These systems not only handle the corporate administrative systems, such as payroll and finance, but perform considerable database processing to augment the TPF platform and deliver Galileo's new managed hosting services.

Storage is central to the Galileo operation. In the early 1990s, the company began replacing legacy IBM 3090 storage with EMC Corp. Symmetrix storage systems. Today, almost all of the company's 102T bytes of storage reside on EMC systems organized mainly into SANs, Auer reports. "The networked storage makes it easy for us to deploy storage on demand," he explains. Administrators can quickly shift storage capacity between systems and applications.

Although the company's mainframe storage consistently grows at about 15 percent a year—not the 100 percent-plus per year storage growth some companies have reported—its open systems storage is growing much faster, driven by new initiatives like managed hosting and novel approaches to delivering data. Still, investing in yet more storage isn't a concern. Rather, Auer believes, storage is the price the business readily pays because the digitized information stored in Galileo's systems is the currency of today's economy.

FreeMarkets Maximizes Every Byte of a NAS/SAN Environment

The climate for online businesses of all types has been terrible, but FreeMarkets Inc., a Pittsburgh-based online B2B sourcing, auction, and consulting services firm with $91 million in revenue last year, has managed to survive. Its achievement, in part, lies in keeping close tabs on technology expenses, including storage.

"We follow the same processes to justify and manage our technology expenses as our customers," says John Benzinger, vice president, information technology. FreeMarkets' customers use the company's auction, reverse auction, and competitive sourcing to reduce their procurement costs. For Benzinger, managing technology expenses meant competitively shopping multiple storage vendors and testing interoperability and performance claims in its internal R&D lab before settling on Compaq Computer Corp. as its primary storage provider. Benzinger also carefully manages the company's 11T-byte heterogeneous storage environment to ensure maximum value from every Megabyte of storage capacity.

FreeMarkets' CFO clearly is willing to approve big storage investments, but requires Benzinger to justify every expenditure. "We do project analysis for every storage investment," he says.

The company's storage environment today consists of 11T bytes of network storage, both SAN and NAS, serving an array of Unix and Windows/Intel servers from a variety of vendors, and several Terabytes of direct server-attached storage. Last year, storage amounted to 4T to 5T bytes. By this time next year, he expects storage capacity to reach 20T

Continued on page 30

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The Ins & Outs of Storage Management

Effective **management** of enterprise network storage will be key to deriving the **most value** from the investment.

BY JON WILLIAM TOIGO

NO ONE LIKES TO THINK ABOUT IT, but business processes are increasingly sensitive to IT outages. A study last year by Stamford, Conn.-based Meta Group pegged the average cost of downtime—across all business sectors—at just over $1 million per hour.

In a related survey conducted by Intel, the leading cause of server downtime was attributed to data storage. The study placed the blame for more than half (55 percent) of planned and unplanned downtime on the failure or disruption of storage components or the corruption of data that they contained.

In point of fact, proactive storage management could have avoided most of the causes of storage failures listed in the Intel research. The monitoring of disk capacity utilization, drive temperatures, and other metrics could have notified administrators of disaster potentials, enabling them to have taken action before failures or service disruptions occurred.

IN THIS ARTICLE

Management Leverages Storage Benefits

TCO Drives Decisions

Standards Lag

Unmanaged or poorly managed storage sets the stage not only for day-to-day operational disruptions, but also for the larger concern of storage disasters that can bring the business literally to a standstill. Without provisions for efficient storage recovery—usually in the form of tape backups or data mirroring strategies—an organization's most precious asset, data, is at risk.

The role of effective storage management is reflected in storage total cost of ownership (TCO). In addition to reducing downtime by predicting failures, storage management contributes to cost savings in terms of reduced labor requirements.

Many vendors are touting the scalability advantages of their products, noting that capacities can grow smoothly from a few hundred Gigabytes to many Terabytes. However, such capacity scaling, in the absence of effective management, merely increases the number of staff required to manage storage. Numbers vary depending on the analyst, but the amount of storage that can be efficiently monitored and administered by a single, trained, IT staffer directly relates to how well the storage itself is instrumented for management. The better the management provisioning, the more storage an individual staffer can handle.

Similarly, the advantages cited by vendors of new, network storage products—such as increased storage performance and accessibility—are quickly offset by high cost of ownership if organizations do not implement the products with careful attention to management. In the absence of effective storage management, increased accessibility simply translates to increased network bandwidth and labor costs. Higher speed and performance merely mean that viruses and worms can propagate more efficiently.

In full-out disasters, the amount of time required to restore data to a usable form is key. This time-to-data storage recovery requirement, as many organiza-

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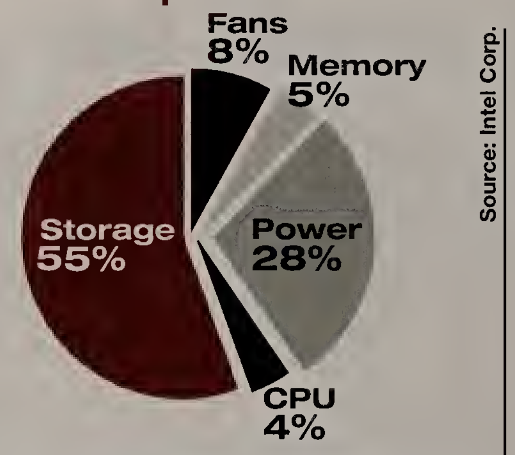
Server Downtime: Storage Is a Culprit



Source: Intel Corp.

According to a recent survey by Intel, storage was the leading cause of downtime. Typical root causes include disk full errors, scaling issues, drive and other hardware failure, cabling issues, and data corruption.

tions are learning, is increasingly difficult to meet as storage platforms themselves become more complicated and management technologies are having difficulty keeping pace. Without data backups, recovery is impossible. However, even with backups, data-restore operations can become bogged down by virtualization software used to simplify the management of storage devices. Some firms report that "mismatched" backup/restore software and virtualization software products used in their shops are creating delays of up to 100 hours just to read a Terabyte of files back from tape to their virtual disk volumes.

Despite the primacy of storage management in containing long-term storage costs, ensuring storage uptime, and delivering storage return on investment (ROI), the question remains: Is the management of storage being accorded a key role in product selection? Depending upon whom you ask, the answer is a definite "maybe."

TCO Is King

For the past several years, driven by annual data growth rates of 70 to 100 percent in many companies, attention has been focused squarely on finding solutions for scaling storage capacity in a nondisruptive way. Vendors have introduced network storage technologies such as network-attached storage (NAS) and storage area networks (SANs) to provide mechanisms for scaling and centralizing storage, citing the improved TCO organizations can glean from such strategic storage acquisitions.

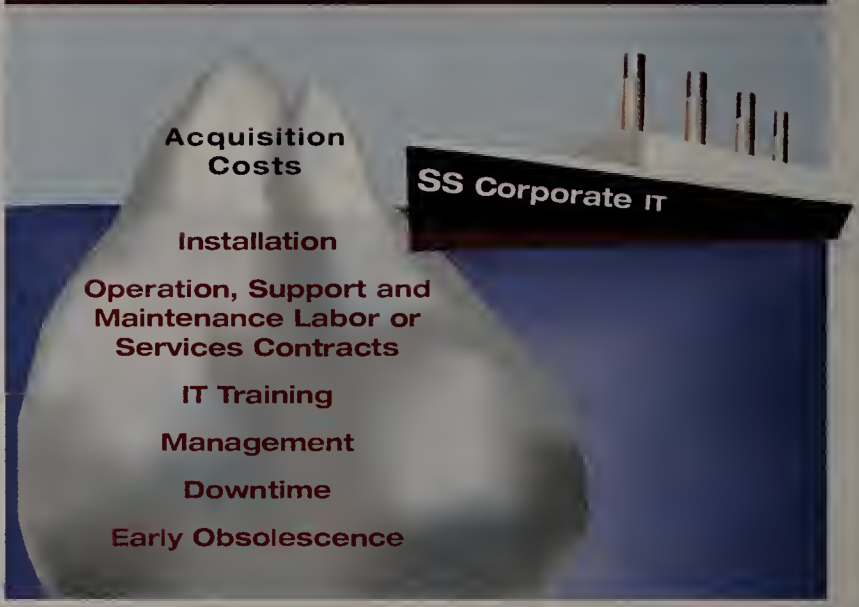
The education of the consumer has been successful, according to Anne Skamarock, senior analyst with Enterprise Management Associates, a consulting firm in Boulder, Colo. She says that technology consumers understand the TCO benefits of network storage. In storage acquisition decision-making, she says, "TCO is king."

John McArthur, vice president for storage research at International Data Corp. (IDC), Framingham, Mass., agrees. He notes that companies have been largely weaned from the view of storage as a peripheral device and now see storage technology as a strategic infrastructure. A major driver of the move to network storage is the perceived value of these technologies in delivering a more robust, scalable, and accessible storage infrastructure. Says the analyst, "Companies are no longer buying general-purpose servers to do file serving. They understand the benefits of data centralization and the centralization of management."

This improved understanding of the strategic value of network storage accounts for the shift from server-attached storage and internal storage deployments to SAN and NAS that has been under way since the late 1990s, according to analysts. In late 2000, IDC predicted a 67 to 68 percent combined annual growth rate for network storage sales through 2004. By contrast, the numbers from IDC envisioned a much slower rate of growth for server-attached storage (7 to 10 percent CAGR) and, for the first time in history, a negative growth rate in internal server disk storage sales (-3 percent).

While McArthur expects the current economic climate to carve about 10 percent from last year's storage spending projections, he remains bullish on

TIP OF THE ICEBERG: HIDDEN COSTS OF STORAGE



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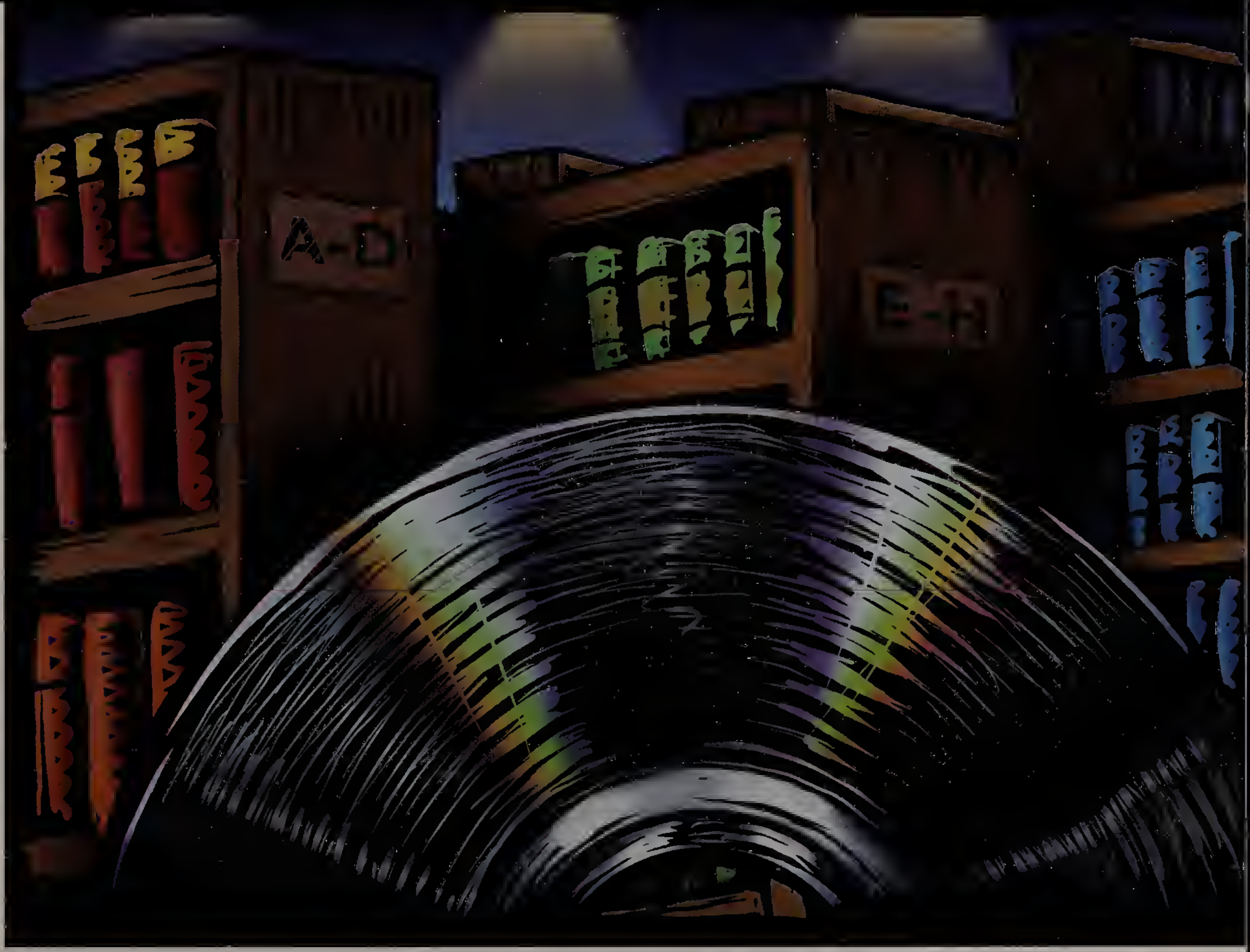

What our Storage in the Enterprise newsletter covers:

The amount of data moving across networks has skyrocketed, and much of that data needs to be stored. Some analysts have estimated that within three years, spending on storage at major companies will be three times that spent on computer hardware. Anne Skamarock, an analyst who specializes in storage at Enterprise Management Associates, brings her 15 years experience in the network storage field to network IT executives each week. With our Storage in the Enterprise newsletters you'll read about how to address such issues as the lack of interoperability among vendor products, storage management and application management, and receive analysis of the marketplace to help you make the best decisions about your storage solutions.

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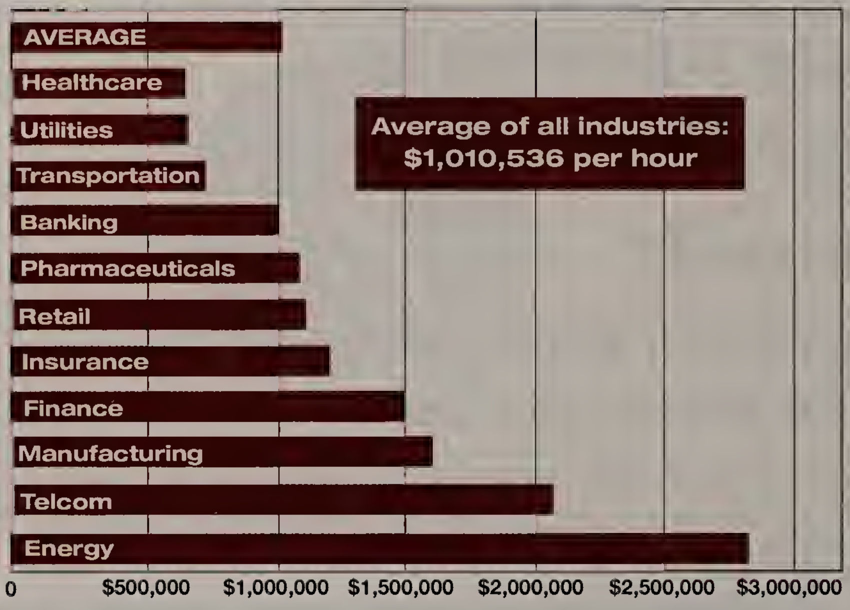
The Price of Downtime



Average of all industries: $1,010,536 per hour

Source: Meta Group

network storage growth. "There is still growth, but I'm not sure it is as fast," McArthur says. "Some companies are still rolling out SANs and NAS. Others are putting their plans on hold, especially in the small to medium enterprise space and in companies that [aren't publicly traded], and are betting more of their own money on network storage deployments."

Skamarock observes, "While storage continues to be required by companies, strategic changes to the infrastructure are being pushed out. Plans to deploy SANs have moved out to the 12- to 24-month timeframes. Last year's study found timeframes to be in the 6- to 12-month range."

Squeezing Costs

Analyst views are being echoed by integrators and resellers, including Hoot Thompson, chief technology officer for Patuxent Technology Partners, Columbia, Md. "Cost of ownership is certainly a key issue for our customers—mostly government organizations and large commercial entities," says Thompson. Also, he says there is a clear correlation between the size of the organization and its operations, and its interest in SAN or NAS.

"A larger enterprise sees the value of storage networking as storage growth outstrips the capability to manage it cost-efficiently with available personnel," says Thompson. "In smaller organizations, however, buying storage and attaching it to a server or LAN is cheaper and avoids the pain of deploying SANs."

Bill Peldzus, storage consulting marketing manager within the storage professional services organization of Imation Corp., Oakdale, Minn., agrees with Thompson's perspective. He adds, "New storage acquisitions are being based entirely on expected cost savings. SAN and virtualization are increasingly being explored, but the bottom line is that companies are looking to aggregate storage in a SAN for longer-term cost savings."

Peldus says the rationale is less about the management advantages of centralized storage than the options that SANs deliver in vendor and product selection. His customers "expect SANs to enable the purchasing of storage in the future as a commodity. [Our customers expect to] be able to reduce storage costs by leveraging different products from different vendors."

Michael Linett, president of Zerowait, a high-availability engineering firm based in Newark, Del., reinforces this view. Says Linett, "Our customers already see storage as a commodity. They've realized that, if they wait two months, storage products will be cheaper and faster. It's like the PC market now."

Linett notes that his company just lost a project in a large firm that elected to host data on idle OS/390 mainframe DASD (direct access storage devices), rather than deploy the network storage solution that Zerowait proposed. The integrator takes it in stride. "We focus on big companies. [Zerowait clients include several Fortune 1000 firms.] In those environments, overall storage is a shell game," Linett says. "They decide where storage needs to be placed and the best way to network to it and load balance around it, based on cost. You are no longer talking about storage, you're talking about networks."

During lean times, Linett says, large companies will play the storage market, buying storage at the cheapest cost or deferring purchases until the price is right. "The real focus is on uptime."

IDC's McArthur confirms Linett's observation. He says companies are making decisions about storage based both on strategic (long-term cost savings) and tactical (short-term cost of acquisition) considerations. "Companies are doing a little of both. They are definitely putting the squeeze on vendors to deliver products at a lower cost. But they are also trying to squeeze long-term costs out of their infrastructure."

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Where's the Management?

For all of the current emphasis on costs and deployment options in storage product acquisitions, little attention appears to be focused on storage management itself. Missing from most vendor product pitches, for example, is any discussion of how network storage is instrumented for centralized management.

Current network storage management standards are lagging behind network storage technology itself. Some storage products may be managed via Simple Network Management Protocol (SNMP) agents, while others articulate their own status monitoring and configuration Web pages, or require the use of proprietary management software sold with the storage device.

Work is ongoing within many standards organizations and trade associations to develop more comprehensive strategies for management of heterogeneous storage environments, but results are slow in coming. Given this situation, it comes as little surprise that many vendors de-emphasize management features.

Without management, network storage is no more stable or resilient than the server-attached or internal storage approaches that it displaces. In fact, unmanaged or poorly managed network storage could be a good deal less resilient than previous storage approaches and more prone to producing storage disasters that are an order of magnitude worse in terms of scope and duration.

Moreover, without management, network storage cannot deliver its purported cost-saving advantages, whether strategic or tactical. In the final analysis, to quote IDC's McArthur, "There is still some customer education to be done." ■

Jon William Toigo is an independent consultant and author of "The Holy Grail of Data Storage Management" and of the forthcoming "The Holy Grail of Network Storage Management," both from Prentice Hall PTR.

A Tale of Two Users

Continued from page 22

bytes. Although network storage has emerged in the last year as the company's primary storage direction, Benzinger does not foresee an end of direct server-attached storage anytime soon. "Direct-connect storage will always play a part. For some things it works best, like Web servers," he notes.

Storage Objectives

Storage is central to FreeMarkets' business plan. "We need to have a lot of temporary storage available, and we take in a lot of MRP data from our customers," Benzinger explains. The company also maintains a massive database containing financial and operational information on 150,000 suppliers. Benzinger's key storage objectives are scalability, availability, reliability, manageability, and interoperability.

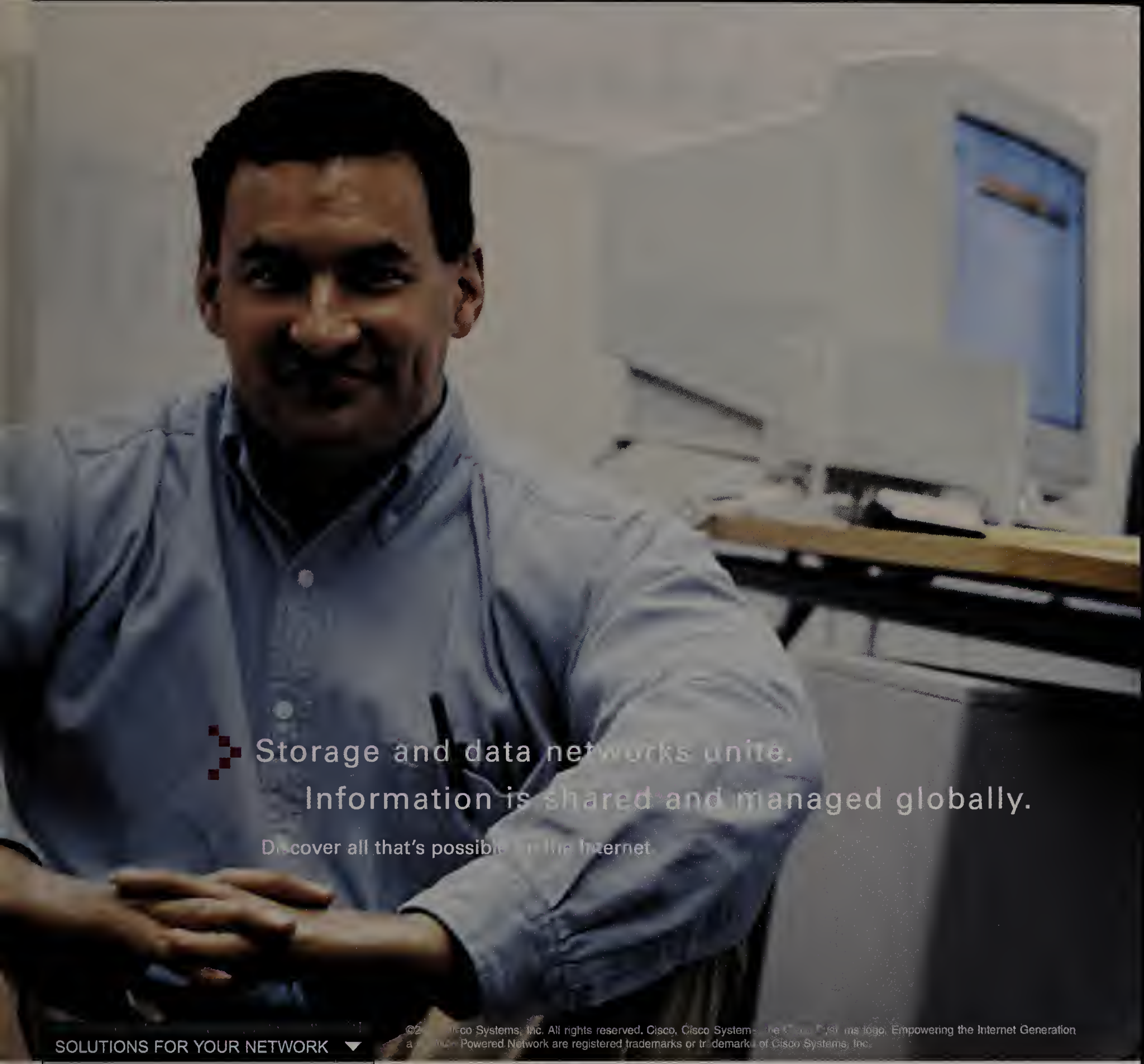
To get the most out of storage resources, storage administrators freely move disk capacity around. "We might have extra capacity in our NAS system. But if we need it in the SAN, we will physically pull it out and move it," he explains. Once the disk is installed in the SAN, however, administrators can allocate and reallocate it through a management console. Two dedicated administrators manage the company's worldwide storage environment. They are supported by a 24x7 network operations center and a handful of network administrators who concentrate on the server environment.

Interoperability and manageability are central to reducing costs. FreeMarkets incorporates the server-attached storage it picks up when it acquires other companies into its storage environment. The company also invests in storage management tools to enable it to deploy increasing amounts of storage without increasing staff. To Benzinger's dismay, however, "there is no tool to manage the total storage environment. We still have to write a lot of custom scripts," he says.

Looking ahead, Benzinger wants to enable FreeMarkets' customers to make greater use of the company's storage through self-service. For instance, IP storage promises to make it easier for customers to bring over their MRP data. It's all part, he notes, of getting maximum value from the company's storage investment. ■

Alan Radding (www.technologywriter.com) is a freelance writer in Newton, Mass.

For more information, please call Shaun Budka, Manager of Custom Media Solutions, Network World, Inc., 508-490-6597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The scoop on wireless LAN snoops

Guardent demonstration points to potential dangers of careless 802.11 network setups.

■ BY JASON MESERVE

What's that unknown person with the laptop sitting on a bench outside your office doing? If you're running an 802.11-based wireless LAN, that person could be watching your employees' every online move.

Guardent, a consulting firm that develops technology for assessing companies' network vulnerabilities, recently took *Network World* on a "tour" through Cambridge, Mass., to show just how much unprotected wireless LAN traffic is floating among the airwaves. Standing along one of the city's major thoroughfares, consultant Jamie Fullerton used an IBM ThinkPad equipped with a standard wireless network interface card and proprietary software written by Guardent to peer into the wireless world.

Most of the information flowing across his laptop's screen was run-of-the-mill network traffic, such as print jobs and boring e-mail. Even so, we saw a router reconfigured, including its IP address, name and other data — the sort of information that would be valuable to a hacker looking to map a network and wreak havoc. Had we been watching earlier, Fullerton says we probably would have learned the router's password.

To an average observer, most of the traffic would look like computer gibberish. But Fullerton's discerning eye could tell what operating systems were being run and the names of all the servers being accessed over the network. He pointed out a number of NetBIOS (Windows) packets that could be put through a simple decoder to read the text.

While there is excitement around the wireless LAN market — Cahners In-Stat estimates the market will be worth $3 billion by next year — there is also plenty of concern about security.

And, unlike wired networks, where an attacker has to be physically connected to a network, a wireless hacker could be driving by in a car or walking around a building. An intruder could even leave a handheld device hidden for a few hours to record traffic (Guardent has a version of its software in the works for Compaq iPaq handhelds).

Air defense

Tips for securing wireless LANs:

- Use VPN software on any machine connecting to a corporate LAN over a wireless network.
- A strong implementation of the Wired Equivalent Privacy standard can protect wireless LAN traffic that "leaks" outside a building.
- If a wireless LAN is offered in a public area of a building, keep its traffic separate from that on the wired network.
- Minimize the amount of transmission power used in the wireless LAN to decrease the distance waves will travel. The average distance for a typical setup is 1,000 feet.
- Be sure to customize your wireless LAN settings, as "default" settings are an open invitation to hackers.

Traffic on wireless LANs adhering to IEEE 801.11 specifications runs across 14 channels in the U.S. using part of the radio spectrum between 2.4 and 2.5 GHz. The typical range for a wireless access point is about 1,000 feet, enough to broadcast traffic outside the physical wall of a building.

Fullerton says many wireless access products come ready-to-use, but have limited security settings. Users should change the default settings on the devices to make them less of an open door to intruders (see graphic).

Companies can also protect data using the same VPN software used to connect remote workers over the Internet. VPNs work the same over 802.11b as they do in a wired network, Fullerton says. Finally, access to wireless LANs should be authenticated, to ensure unwanted users remain "outside."

"A company along the [Charles River in Cambridge] has a wireless connection for its courtyard, but they keep it separate from the wired LAN," Fullerton says. "Employees using the wireless network need to connect through a VPN."

Guardent gave the demonstration to help promote its new wireless security assessment service, which starts at around $10,000.

Guardent: www.guardent.com

Short Takes

■ **Network Appliance** last week introduced its first multiprocessor storage appliances designed to work with large databases or complex corporate applications such as enterprise resource planning software. The F880 can handle up to 6 terabytes of data, and the F880c can scale up to 12 terabytes. As Network Appliance upgrades other parts of its software line, the company expects the larger unit to be able to manage 18 terabytes of data. Available immediately, the products start at $135,000. www.netapp.com

■ **Hewlett-Packard** last week introduced the e-PC 40, a small-footprint desktop computer with built-in diagnostic tools that could help end users solve some of their own technical problems instead of calling their IT departments for help. The machine is 3.7 inches wide, 9.8 inches high and 11 inches deep, and weighs less than 10 pounds. The e-PC will cost $580 with an Intel Celeron processor and $850 with a Pentium IV processor. www.hp.com

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Extreme makes apps switching play

■ BY PHIL HOCHMUTH

ATLANTA — Extreme Networks last week bolstered its switch lineup with two products aimed at enabling customers' networks to handle traffic more intelligently.

The products, announced at NetWorld+Interop 2001, include a full-blown application switch and an application switching module for the company's existing Black Diamond Gigabit Ethernet chassis.

SummitPx1 is a single-port, Gigabit Ethernet switch that could sit in front of a Web server farm to direct traffic to the appropriate server based on packet inspection done at Layer 4 (the TCP/IP, or transport, layer of the OSI stack) and Layer 7 (the application layer).

Extreme's other new product, the PxM module, does the same job as SummitPx1, but fits into a BlackDiamond 6800 chassis, letting customers deploy one fewer device on their networks. The module can tap into the 256G bit/sec backplane of a BlackDiamond.

Extreme says its new gear includes hardware-based Layer 4-Layer 7 switching logic, which will initially be deployed in the products as reprogrammable chips called field programmable gate arrays (FPGA). During the next few months, Extreme plans to convert these FPGAs into application-specific integrated circuits, which provide better performance (although Extreme would not say how much faster the ASIC-based products would be). The FPGA technology for SummitPx1 and the PxM module was acquired when Extreme purchased Web switching firm WebStacks in March for $15 million.

According to Extreme, competing products, such as Cisco's CSS 11800, Foundry's ServerIron 400 and Nortel's ACEswitch 184, all execute Layer 4-Layer 7 switching functions either in software or in a mix of hardware and software. Extreme says its hardware-based Web switching products can provide 10 times the performance of software-based switching products.

Extreme's SummitPx1 will be available this month for $50,000. Pricing for the PxM module was not released, but Extreme says the module will be available by year-end.

Extreme: www.extremenetworks.com

TOLLY ON TECHNOLOGY

Kevin Tolly

Invasion of the offloaders

As relentless as cockroaches in a Manhattan apartment, vendors of Web server offload/Web acceleration devices are coming out of the woodwork. The products are, paradoxically, so similar to one another and yet so different. Chosen and implemented properly, they can yield great benefits for network managers. Choose the wrong one for the job and this erstwhile panacea becomes a Pandora's box. Allow me to explain.

As intranets and, especially, e-commerce boomed in recent years, sales of Web servers exploded. Naturally, increased traffic eventually would drive the server to such a point that it became a bottleneck — triggering the purchase of yet another server to share the load.

More than one entrepreneur noted that, in almost every case, the bottleneck was not systemwide but was resource specific — usually the server CPU. More importantly, it was often a single high-use, high-drain function that was consuming the majority of the resource.

The notion of Web server offload followed quite naturally. If one could remove just one high-draw function from the main processor, immense amounts of CPU power could be made available for application functions.

Given the cost of server hardware, license fees, setup and administration time — not to mention rack "real estate" for those companies (e-commerce infrastructure often was hosted by a third party) — the value proposition was about as close to a "no-brainer" as you could get.

While some established firms, such as Intel and Nortel, are dabbling in this realm, for all intents and purposes it is exclusively the realm of an array of nimble start-ups — companies such as Abeona Networks (Web acceleration), Akamba (Web server offload), Alacritech (Web server acceleration), ClickArray (Web server offload) and FineGround Networks (content acceleration), Redline Networks (TCP and HTTP acceleration) — to name just a few.

In the aforementioned group we find TCP, Secure Sockets Layer (SSL), HTTP and other functions offloaded and accelerated. Most companies provide a single function such as TCP or SSL offload, but several "next-generation" devices deliver "multiple offload" features.

Through no fault of the vendors, this is an extremely fragmented arena. Conceivably, one could require multiple functions — and thus multiple products — "front ending" the server. That could be a nightmare to manage. Thus, even classifying these products — a necessity for making detailed comparisons — is troubling.

And, because many of the vendors take the "secret sauce" approach to their products (that is, they don't really want to tell anyone how they work) benchmarking becomes a challenge.

Some of these "black magic" boxes work by inserting themselves fairly high up into the protocol stack.

When this is the case one need always be concerned not only about compatibility problems, but about finger pointing when troubles occur.

With all that these new devices have to offer, though, prudent network professionals should consider offloading some of their worries onto them.

Tolly is chairman and CEO of Tolly Research. Tolly also is founder, president and CEO of The Tolly Group. He can be reached at ktolly@ tolly.com.

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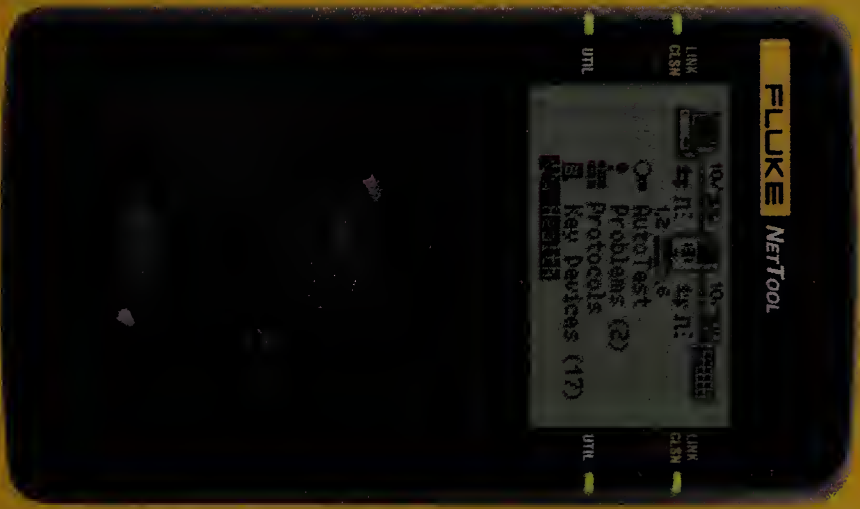

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Special Focus

CONVERGENCE Cisco's voice-over-IP-plus strategy.

Has Cisco's AVVID lived up to the early hype?

■ BY PHIL HOCHMUTH

Almost two years ago, at NetWorld+Interop 1999, Cisco first announced AVVID (architecture for voice, video and integrated data), its all-encompassing blueprint for converged enterprise networks.

While the list of products that come under AVVID's umbrella continues to increase, some users still see the architecture as focused predominantly on voice over IP rather than as a broad, overarching framework encompassing security, VPNs and other products, as Cisco has positioned it.

Indeed, since its introduction to the market as Cisco's convergence blueprint, AVVID has become synonymous with IP telephony to many Cisco customers.

"We looked at AVVID as a cost-savings measure," says Billy Rudeck, network coordinator for Village Care of New York, a Manhattan nonprofit network of health clinics. Rudeck says his firm is looking into Cisco AVVID voice-over-IP products to replace Mitel phones and PBXs in the organization's seven facilities throughout the city.

"We know Cisco knows what they're doing with [voice over IP], even though they were not involved in telephony in the past. They're the pioneers in IP telephony," he says. "The potential is there in our network for these IP phones to reach more than 1,000 users."

While Cisco's AVVID brand has helped the company become a leader in IP telephony — Cisco became the No. 1 seller of IP phones this year, according to Cahners In-Stat — the vendor wants to spread its AVVID brand further.

AVVID product lineup

The following products are the key VoIP pieces in Cisco's AVVID product lineup:

Media Convergence Server: An Intel Pentium-based server running the Windows NT operating system, also known as an IP PBX.

CallManager: Software that runs on Media Convergence Server, providing PBX-like functionality, such as call control, hold, call transfer and other basic office telephone system features.

Cisco 7900 series IP phones: A variety of IP telephony client devices, such as speaker phones and XML-enabled phones that can act as Web browsing thin clients.

In-line power switch modules: Blades for Cisco's Catalyst 4000 and 6000 switch lines that can provide AC power to IP telephones, similar to the way PBXs supply power to circuit-switched phones.

Cisco Unity: Cisco's unified voice and e-mail server, which provides voice mail for CallManager servers and can work with Microsoft Exchange servers to provide end users with one mailbox for voice mail and e-mail.

AVVID: More than just VoIP, Cisco says

One thing that Cisco has stressed is that AVVID is supposedly more than just the marriage of IP video/voice to traditional datacom products. Lately, the company has lumped almost every non-service provider announcement it makes — including those on PIX firewalls, VPN products, security and network management software, content distribution and Web switching appliances, as well as storage routing products — into the AVVID product family

Last year, Cisco said it would invest heavily in integrating software and hardware into a more cohesive network communications layer. The push to expand AVVID's umbrella was led in large part by James Richardson, Cisco's chief marketing officer, who oversaw AVVID's inception and development as the former vice president of Cisco's enterprise line of business (Richardson changed titles when the company reorganized last month).

Richardson has said that investments in middleware development will let AVVID become more than an IP voice and data convergence blueprint and reach into all areas of large enterprise networking — such as e-commerce, content delivery networks and security.

Cisco has taken the steps to do this. The firm has spent more than $4 billion on software companies, while increasing the number of partners in AVVID to 33, including several new members in the security area, such as content filtering firm N2H2, Entrust Technologies and Sygate, which makes personal firewall software.

Also in line with its software investment strategy, Cisco recently released the applications for companies to install around the converged IP voice and data infrastructure promoted by AVVID. Cisco has added personal messaging management applications, scaled-up IP call center applications for both large and small businesses, management software specifically for controlling an IP voice environment and most recently, a version of its unified voice/e-mail messaging software for large companies.

AVVID perceptions

While Cisco has spent billions of dollars on positioning and marketing the AVVID brand, users and network integrators who actually work with AVVID products on a daily basis are making up their own minds about what works, and what doesn't, regarding Cisco's "uber-brand."

"Cisco has done a pretty good job of trying to wrap a brand around AVVID," says Stu Feddersen, vice president of Network Visions, a Herndon, Va., network integration firm that specializes in installing Cisco voice-over-IP products in small and midsize companies.

"A while back [AVVID] was kind of a piece-parts strategy with different manufacturers' products they bought. They've brought it into a pretty cohesive marketing piece," he says.

While Feddersen says he has seen AVVID evolve as a marketing plan and product integration blueprint, he says pushing AVVID's scope beyond IP voice and video might be a stretch for Cisco.

> **"A while back [AVVID] was kind of a piece-parts strategy with different manufacturer's products they bought. They've brought it into a pretty cohesive marketing piece."**
>
> **Stu Feddersen**
> Vice president, Network Visions

"I really haven't seen Cisco roll out security pieces or wireless or storage under AVVID," he says. "I don't know how that's going to work. I don't know if it makes sense either. AVVID's already pretty broad."

Feddersen adds that trying to sell IP telephony to a business has unique challenges. Cisco could risk making enterprise users shy away from an already complex technology by piling more applications and technologies on top of AVVID.

Other users call into question Cisco's choice to rely heavily on Microsoft products for many of the key parts of AVVID, such as a server and messaging platform.

"Cisco AVVID products have their limitations because they're kind of [Microsoft Windows] NT-ish," says Steve Donnegan, a senior network architect with Predictive Systems, an integration firm in New York. Donnegan, who has helped several companies install Cisco voice-over-IP sites, says because Cisco's CallManager software and Media Convergence Server hardware are based on the NT server operating system, the offering can be a turnoff for some corporate users.

One early adopter says he would like to see Cisco rely less on Microsoft software, but is not displeased with his AVVID-based voice-over-IP network.

"My gut feeling is that Cisco is a data company in the first place and a telephony vendor in the second place," says Jim Olson, CIO of Menlo College in Atherton, Calif. Menlo uses Cisco's CallManager software to support 600 students, staff and faculty on its IP phone network.

Olson figures Cisco did not want to reinvent the wheel when it got into the voice-over-IP business by creating its own IP PBX operating system.

"Cisco wants to be first to market with an IP voice server, so they developed something fast and got the thing out the door and that's fine," he says.

While Olson hasn't experienced many problems with CallManager servers crashing, he would like to see Cisco come up with either a Unix- or Linux-based platform for its IP voice servers.

"Cisco is new to servers," Olson says, but he doesn't see that as a major problem. "AVVID is the way to do [voice over IP]. If I were to go with another college, I'd choose to install [voice over IP] with Cisco again." ■

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InSite: Lessons from Leading Users

BIC brings employees together via intranet

■ BY JENNIFER MEARS

BIC is probably best known for its pens and lighters, but it also sells a variety of correction fluids and stationery. Last year, the global company realigned itself around these product categories, requiring employees separated by thousands of miles to work together.

When BIC asked employees how their jobs could be made easier, the overwhelming response was to make long-distance collaboration easier. That's what BIC is doing, thanks to help from portal software vendor Plumtree and digital collaboration software maker eRoom.

Plumtree and eRoom are the cornerstones of an intranet project, dubbed Maestro, that aims to increase productivity at its 65 offices by giving employees a single point of access to the information and resources they need, as well as connecting them across time zones and continents. While BIC hasn't estimated overall cost savings, the company expects to reduce its travel budget by 10% in 2002 because of the efficiencies created by Maestro.

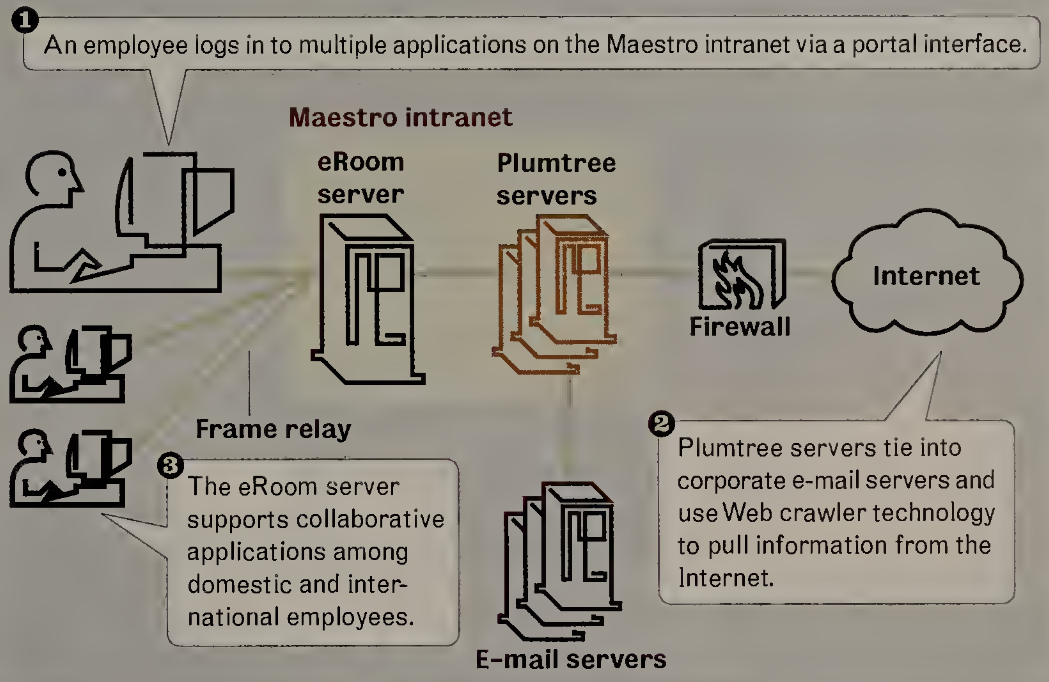
BIC was using e-mail, but "we really needed to take it to the next level. It made sense to develop an intranet, which was geared toward an anytime, anywhere type of technology," says John Augenstein, global intranet project manager for BIC.

Augenstein looked at a variety of portal vendors, which he declined to name, in early 2000 and settled on Plumtree and eRoom that spring.

See BIC, page 24

Keeping things organized with Maestro

BIC's intranet, dubbed Maestro, gives employees centralized access to a host of applications and data.



① An employee logs in to multiple applications on the Maestro intranet via a portal interface.

② Plumtree servers tie into corporate e-mail servers and use Web crawler technology to pull information from the Internet.

③ The eRoom server supports collaborative applications among domestic and international employees.

Short Takes

■ **IBM's Lotus Software** division last week said it would ship a Mobile Notes client for the **Compaq** iPaq Pocket PC handheld by the end of this year. The client will enable access to mail, calendars and address books from the iPaq. Pricing was not announced. Earlier this year, Lotus announced support for Palm OS handhelds and the Nokia 9210 Communicator multimedia device. www.lotus.com

■ Database software maker **Oracle** said last week it has acquired **3Cube,** a small maker of collaborative software for hosting online meetings. Oracle is not disclosing any terms or details of the deal. 3Cube, which is a privately held company in Burlingame, Calif., was formed in 1999 and developed several Web-based communication services that let customers hold online meetings and collaborate on projects over the Internet. Its flagship product, Web Meeting Services, lets users share access to Internet applications such as Web browsers on remote computers and make Web-based phone calls. www.oracle.com; www.3Cube.com

Firm sharpens self-help tools

Web-based software aims to take the load off customer service.

■ BY ANN BEDNARZ

LOS ANGELES — KnowledgeBase Solutions last week announced a new version of its flagship software, making it easier for users to create, retrieve and edit documents to be shared with employees and customers.

KnowledgeBase.net 2.0 provides the tools companies need to build self-help features into corporate intranets and Web sites. The goal is for employees and customers to be able to find answers to their questions by searching a repository of text, audio and video files — without enlisting a help desk or customer service agent in the process.

The 7-month-old company touts the simplicity of its product: To add a document to a corporate repository, a user simply right-clicks his mouse.

For Xsense Connectivity, this means all its engineers can easily contribute to the company's growing repository of technical notes, frequently asked questions, troubleshooting procedures and glossaries, says Howard Cheng, director of operations at the network equipment distributor. Xsense started using KnowledgeBase.net in July, and the company has built its knowledgebase to include 100 documents.

Support for Adobe PDF files is new in Version 2.0. Previous versions supported Microsoft applications, including Word and Excel, as well as Text and Rich Text Format files.

Version 2.0 also adds an authoring tool that lets users write documents directly to HTML, rather than converting word-processor documents.

KnowledgeBase. net converts the files to HTML and indexes documents by keywords and phrases; alternatively, an administrator can override or expand upon those keywords. At the heart of the system is a search engine that supports keyword searches and natural language queries.

Customer queries are tracked, and the results can be used to fine-tune items such as frequently asked questions. In addition, KnowledgeBase.net can export

See KnowledgeBase, page 24

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'NET INSIDER

Scott Bradner

The end of the free world?

Last week I ranted about the Digital Millennium Copyright Act. But, leave it to Congress — something far worse may be in the works.

Sen. Fritz Hollings, D-S.C., is on the verge of introducing legislation that would, in effect, outlaw computer innovation and might just make it a crime to compete with Microsoft. Hollings is reportedly about to introduce the Security Systems Standards and Certification Act, a copy of which was leaked to *Wired*. (See the draft bill at www.politechbot.com/docs/hollings.090701.html.) This bill would cover any new "interactive digital device" and would require that all such devices "include and utilize" copyright protection technology certified by the U.S. Secretary of Commerce.

According to the draft, the term "interactive digital device" means "any machine, device, product, software or technology, whether or not included with or as part of some other machine, device, product, software or technology, that is designed, marketed or used for the primary purpose of, and that is capable of, storing, retrieving, processing, performing, transmitting, receiving or copying information in digital form."

There was a fascinating article in the September issue of *Smithsonian* on Dan Foster, who uses sophisticated word usage analysis to figure out who authored various documents. I do not think one needs to use his techniques to figure out that this bill was written by the copyright industry and not by Hollings or his staff.

As an author, it is a laudable goal to protect the rights of copyright holders, but this is a case where the cure is far worse than the disease. Dealing with copyrights in the digital age is not easy. See the National Research Council report titled "The Digital Dilemma" (http://books.nap.edu/html/digital_dilemma/). I was on the panel that produced this report, and we spent a lot of time discussing technical protection systems such as the one that the bill seeks to mandate. The report concluded that "there is a great diversity in the kinds of digital intellectual property, business models, legal mechanisms and technical protection services possible, making a one-size-fits-all solution too rigid."

In addition, there is the potential for significant collateral damage from a rule of this type. First, the definition of interactive digital device is vague and could cover anything from a microwave oven to a supercomputer, all of which would be made more expensive and complicated by this law. But worse, the use of the term "utilize" in the bill would mean that only trusted operating systems could be used on the computers. Say goodbye to Linux and to most flavors of Unix. The logical conclusion is that only Microsoft and Apple operating systems would be legal because those companies could produce "secure" systems that could keep people from programming around the protection system.

This rule might be good for Mickey Mouse, but it is very harmful to the rest of us.

Disclaimer: Whatever Harvard is, it is not Mickey Mouse, and the above observation is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

InSite: Lessons from Leading Users

BIC,

continued from page 21

BIC has three hubs, in Connecticut, France and Brazil, all linked via international frame relay lines. Local BIC offices are tied into the backbone via frame relay links as well.

He says launching Maestro was "pretty straightforward" because BIC relied on eRoom and Plumtree to help with the implementation. The Plumtree software runs on a batch of Microsoft servers — two Web servers, a job server, a database server and a file server — and eRoom runs on a single Web server, but uses the Plumtree database server for such things as indexing.

"With our infrastructure staff working with the eRoom and Plumtree technologists, we were able to order the servers, bring the servers in, install software and test it. We basically went from concept to launch in five months," he says.

Maestro is available to about 3,500 employees in four continents, with between 150 and 185 users accessing the portal at any one time.

BIC's main concern was to provide collaboration capabilities, which it gets through eRoom's software. But it also wanted to give employees a personalized window into the digital information and resources they needed, which the company did.

Plumtree uses software components called gadgets to link the portal with applications and digital content. For example, if BIC wants to give employees companywide portal access to a financial application running on a server in France, it writes a gadget for that application and links it to the portal. Users then have a graphical interface to that application from the portal, no matter where they are.

The Plumtree software can organize content and resources specific to each employee's needs. In addition, the portal maintains user roles and password requirements, so that each user has access only to appropriate information. BIC employees previously had to go through several steps to get information they needed. For example, a communications employee might have had to check out competitor and partner Web sites, look for BIC-related news, check stock numbers and send e-mail.

"That person would have had to go to six or seven or eight different areas for information," Augenstein says.

"What the portal and the gadgets allow you to do is bring much of that information to a centralized location. So they don't have to look in seven different places, they can now look in a single location," he adds.

Ultimately, Maestro will be available to all 9,000 BIC employees and will provide access to enterprise resource planning, human resources and financial applications. But initially the focus is on e-mail, news feeds and other widely used resources. The most popular link from the portal is to an eRoom, he says.

"They can launch into Maestro, check their e-mail and then jump right into an eRoom," he says. "So rather than having to go to the Internet first, mail second and eRoom third, they can go to one location and get all that information."

ERoom provides a digital workplace where updates and changes to works in process can be made and viewed by multiple users simultaneously.

"So, for example, in public relations, at any given time, we're working on several news releases at the same time," says Linda Kwong, BIC's director of corporate communications. "Rather than having to e-mail my associates with changes and getting things back and having things flying all over the place, [in the eRoom] you can put in comments to your co-workers, you can update things, change things, highlight what you've done, add what you want and it's all in one place." ■

KnowledgeBase,

continued from page 21

Self-service saves

Forrester Research found that calls to a live customer service representative cost companies an average of $32.74 per transaction, while Web self-service transactions average just

$1.17

per visit.

visitor search records to a company's customer relationship management (CRM) software so it can track prospects' interests, for example.

New to KnowledgeBase.net in Version 2.0 is an "unanswered questions" report that points companies to the information its intranet users and Web site visitors are seeking.

KnowledgeBase competes with higher-end search vendors such as Ask Jeeves; CRM vendors with self-help functionality; and self-help software vendors such as eHelp. KnowledgeBase distinguishes itself by offering the tools not only to search for documents but also to populate the repository, says Alex Kazerani, KnowledgeBase CEO.

KnowledgeBase.net 2.0 is available now. Customers can subscribe to the company's application service or license the software and deploy it onsite. In the hosted version, pricing is based on the number of articles imported. For example, if a customer wants to store 5,000 articles, each article would cost 35 cents per month.

This pricing formula, which lets companies pay as they grow, was a strong selling point for Xsense, Cheng says. "The complete function set is open to customers of all levels," he notes, whether a customer has 100 or 10,000 articles on the system.

Onsite software licenses also are based on document volume and typically start at $30,000 for an unlimited number of users.

Thus far, 350 companies subscribe to the hosted service, including Siemens ICN, Jamcracker and Noble Drilling. Only "a handful" of companies have deployed the product onsite, Kazerani says.

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Short Takes

■ More bad news emerged from the application and infrastructure service provider industry last week:

Breakaway Solutions, which has had a brutal 2001 with two CEO resignations, layoffs of more than 100 employees and mounting losses, says it will attempt to stabilize operations and find a buyer while under bankruptcy protection.

Loudcloud, an infrastructure services provider founded by former Netscape executive Marc Andreessen, has announced an undisclosed number of layoffs and a reorganization in a cost-cutting effort designed to carry the company through to profitability. Loudcloud says the restructuring, along with a recent partnership with Qwest Communications, will help it to reduce cash burn to $18 million to $20 million by the second quarter of next year and carry it to profitability during 2003.

USinternetworking says it is laying off an undisclosed number of its 850 employees as it continues to search for more funding in an effort to break even by the end of this quarter. USi led the application service provider market with $100 million in revenue last year, according to market research firm IDC. But the company, which announced 150 layoffs in January and another 250 in April, has been bleeding red ink, with a $51.5 million loss in the last quarter.

■ **Sprint PCS Group** has joined the Java bandwagon, announcing an application developers' program in conjunction with Sun and support for Java on a Samsung Electronics handset running Palm OS. Sprint PCS will start shipping the i300 handset from Samsung with Java support by the end of September. Sprint PCS already offers handsets from Kyocera that can run Java applications. Nextel, NTT DoCoMo and Nokia also support Java-enabled phones. Sprint PCS will team with Sun officials and analysts to judge a Java developers contest at Sprint PCS' developer conference to be held next month in Las Vegas.

Yipes extends Ethernet line

New LAN-to-LAN offering scales up to 1G bit/sec.

■ **BY MICHAEL MARTIN**

ATLANTA — Yipes Communications last week launched a LAN-to-LAN Ethernet service designed to give customers a more flexible alternative to private lines and frame relay.

The carrier's new Layer 2-based National Area Network service supports any protocol that can run on an Ethernet network and lets customers scale up to 1G bit/sec.

Like other Yipes offerings, National Area Network lets customers order bandwidth in 1M bit/sec increments on demand.

Yipes, which is based in San Francisco and operates networks in 21 cities across the U.S., will also continue to offer its existing Layer 3-based WAN service — now called Yipes VPN. That service supports only IP and has a maximum bandwidth of 100M bit/sec.

Officials, who announced the service at NetWorld+Interop 2001, would not release specific pricing on the new service, but said the cost would be competitive with frame relay and private-line services.

Yipes is supporting the new offering with service-level agreements (SLA) covering latency, packet loss, throughput and installation time. Officials say the SLA parameters are comparable to what customers would get with a frame relay or private-line service.

Yipes will initially use Multi-protocol Label Switching to support the National Area Network service, but plans to eventually move to managed wavelengths.

NETWORLD
+INTEROP

Web-based service

Also new from the carrier is Yipes NOW, a Web-based service that lets customers add bandwidth within seconds of ordering it. Previously, customers had to call Yipes directly to get bandwidth added on demand.

With Yipes NOW, customers log on with a user name and password to access the interface. Yipes guarantees any additional bandwidth will be available within 5 seconds, although the company says the provisioning time is much less.

See Yipes, page 26

Visual Networks plots new course

Plans call for developing analysis software and open interfaces to other platforms.

■ **BY TIM GREENE**

ROCKVILLE, MD. — Visual Networks is laying out a three-year plan to expand its products beyond the frame relay, ATM and IP monitoring software that is the company's bedrock.

The company says it will continue to push its performance-monitoring software into other vendors' products and make the data it gathers available to other applications, such as service provider operations and support systems. Earlier this year, ADC announced it will include Visual's ATM agents in ADC access products.

Visual will also develop applications that analyze reports produced by its software so large companies and service providers can improve network capacity planning and problem troubleshooting.

Visual says it plans open software interfaces between its applications and Web browsers, and third-party reporting and management software.

The company is working on XML interfaces for its performance-reporting software so performance reports can be accessed via Web browsers. Currently, data collected by its probes are only accessible via a proprietary application programming interface.

The company's core products, VisualUpTime, IPInsight and Visual eWatcher, consist of probes that gather network performance data and software that turns the data into reports. These reports can be used to measure whether service-level agreements are being met and to track down where problems exist in networks.

The company has already expanded its IP capabilities to support monitoring of Multi-protocol Label Switching traffic. This tracks IP traffic from site to site across public IP networks as if it were monitoring a virtual circuit. The company also plans to build IPInsight into hardware appliances that can be placed at individual user sites to track performance.

Visual will also develop performance analysis software sometime after next year that will focus on IP, voice-over-IP and mobile data traffic.

Last year, after plummeting revenue and disastrous earnings, Visual abandoned its push into companies to go back to providing tools for service providers. It laid off 140 employees and closed two sites. ■

Visual roadmap

Visual Networks is laying out a three-year plan for expanding its network monitoring software.

- Through the end of this year: Develop an XML interface so data gathered by Visual Uptime, IPInsight and eWatcher software can be viewed by Web browsers.
- During 2002: Develop CORBA, HTTP and other interfaces so the data can be shared with service provider portals, operations and support systems, and service management portals.
- From 2003 to 2004: Develop analysis software that mines the data for planning and provisioning, supporting service-level agreements and troubleshooting.

EYE ON THE CARRIERS

Lisa Pierce

Wireless technology: No plan is a bad plan

When it comes to planning a wireless strategy, corporate users who responded to a U.S. Giga poll are representative of the North American user population. A little more than a third responded that a national or regional strategy and policy regarding services was in place, but 38% indicated their companies have no management plan. About a quarter of those surveyed have only guidelines in place. To us, this means that more than 60% of U.S. companies lack a formal, uniform strategy and policy regarding wireless services.

Corporate users who responded to a similar Giga poll in Western Europe reported similar responses — 31% had no formal strategy, and 35% have only guidelines in place. We found that 32% had no national or regional strategies in place. These statistics imply that although Western Europeans rely far more on wireless services than do North Americans, their focus on proactive management has not kept pace.

No wonder then, that more than 22% of North American and 20% of Western European respondents claimed to have no idea about how much money their companies spend on wireless. Without centralized procurement, employees typically voucher expenses for devices and services — which means that with the exception of simple voice calls, there is an absence of uniform features. Furthermore, the lack of centralized contract negotiations and contracts means that companies are paying too much for the devices and services their employees use.

Should these organizational trends continue, consider their implications for the rapidly emerging world of 2.5G wireless data services:

- There are few pre-established corporate standards for handheld devices, which in turn creates great impediments for widespread use of wireless applications.
- Without device standards, it becomes difficult to establish uniform security methods and procedures. As a simple example, ponder the type of information your company might consider acceptable or unacceptable to store on a handheld — a device that by its very size will be misplaced and lost more frequently than will a laptop.
- Think you are paying too much for wireless service now? So far, 2.5G services aren't any sort of bargain. To be blunt, they have the potential to make today's 2G diseconomies look like so much loose change.
- Most importantly, standardization of applications, platforms and security is essential for any organization to achieve a competitive advantage using this technology. Clearly, successful early adopters have done so and continue to learn and innovate.

Many companies may make the mistake of thinking that their lack of immediate plans to use 2.5G technology means there is no great urgency to tackle the issues raised here. But make no mistake, these impediments won't stop individuals from using 2.5G technology — the real and touted benefits are far too great.

However, in their naiveté, employees have no idea of the trouble they may inadvertently cause their organizations. Simply banning the presence of this technology won't stop its use. Proactive, centralized planning and management are essential; companies on both sides of the Atlantic must get out ahead of this technology to harness its benefits and curb its shortcomings now.

Pierce is a research fellow at Giga Information Group. She can be reached at lpierce@gigaweb.com.

Yipes

continued from page 25

Customers can get price quotes on the added bandwidth through the same interface.

Yipes needs to continue offering innovative services if it wants to make any headway against interexchange carriers such as AT&T and Sprint, and the regional Bell operating companies, says Nick Maynard, an analyst with The Yankee Group in Boston.

Perhaps the toughest hurdle to overcome will be convincing customers Yipes can match the larger carriers in terms of service quality, he says.

"If an enterprise can save a lot of money by going with Yipes, then there's a good chance the enterprise will go to them," he says.

"But the enterprise is also going to want the service and reliability it's used to getting from the incumbent carrier," he says.

Yipes: www.yipes.com.

More online!

Read our editorial on how Yipes fares against the big guys.

DocFinder: 6028

Rhythms shutdown in limbo after attacks

Bankrupt DSL provider may be forced by FCC to carry on.

■ **BY JULIE BORT**

As the U.S. government limps along in the aftermath of last week's terrorist attacks, one of the heartiest broadband battles has been put into limbo, leaving these questions unanswered: Will beleaguered DSL provider Rhythms NetConnections be allowed to cease its operations as its management and creditors want, or will the Federal Communications Commission continue to force the company to carry on, supporting its customers?

Last Monday, the U.S. District Court for the Southern District of New York agreed to step in and rule on the matter, removing the issue from the hands of the U.S. Bankruptcy Court. The District Court scheduled a hearing for Friday. However, the court building is located a few blocks from the World Trade Center, and it was unclear by press time whether the hearing would be able to proceed Friday.

In the meantime, Rhythms, which is based in Englewood, Colo., and serves 33 cities, continued to operate "to the best of our ability," a company source said. "The last authority to speak was the FCC, and as law-abiding citizens we are obeying that decision."

Last week, the FCC's message was to deny Rhythms the right to terminate its network last Tuesday, as the carrier had planned.

Rhythms had also scheduled for last Tuesday an auction of assets, which has been postponed until a network termination date is established.

Cease operations

On Aug. 10, Rhythms filed an application with the FCC to cease operations, the FCC says. The commission notified the public on Aug. 24 and requires a service provider to continue operations for 31 days after the public is notified.

Had Rhythms done nothing, the termination would likely have automatically been approved for Sept. 24. "In cases where a company is applying for discontinuance, the application is automatically granted in 31 days unless the commission says otherwise," an FCC spokesperson said.

However, Rhythms management and its creditors applied to the FCC for approval to terminate last Tuesday, rather than on Sept. 24, the 31st day after notification. But the FCC had received 38 complaints against that termination date as of the Monday hearing, which spurred it to these complaints. This in turn convinced the District Court to hear the case.

Among those who wrote to the FCC was Broadband Solutions, a DSL reseller in Denver.

"The problem is that customers haven't been moved yet. We've been able to move more than 100 to Qwest [Communications], but not everyone qualifies," says Bill Zimmerling, president of Broadband.

DirectTV has also reportedly lobbied the FCC to delay Rhythm's demise, citing its 17,000 customers that rely on the Rhythms network and asking the FCC to extend Rhythm's operations until at least Nov. 24.

Alternative service

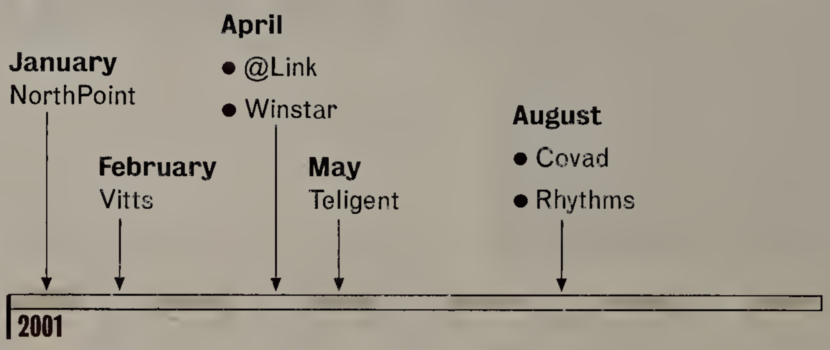
Broadband is getting creative in looking for alternative DSL service. In addition to Qwest, it has been trying to move customers to Covad Communications, another DSL provider that filed for Chapter 11 bankruptcy protection in August.

But many customers refuse this option. So Broadband struck up an agreement with managed VPN provider Netifice Communications in Atlanta, to use Netifice's DSL network and is waiting on about 100 more orders to be fulfilled.

Meanwhile, although few employees remain at the company, Rhythms' network continues to stay online, Zimmerling confirms. ■

CLEC wrecks

Rhythms is just one of several CLECs that has filed for Chapter 11 bankruptcy protection this year:



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The Edge

■ SERVICE PROVIDER DEVELOPMENTS
AT THE JUNCTURE BETWEEN THE ENTERPRISE
AND THE NEW PUBLIC NETWORK

CPlane touches down with Ignition Control

Start-up promises to make service creation take off.

■ **BY TIM GREENE**

SUNNYVALE, CALIF. — Start-up CPlane this week is announcing software designed to make it easier for IP service providers to create new services and quickly activate them for individual customers as they place orders.

Called Ignition Control, this software defines services, checks whether the network has the resources for each customer, and then automatically activates the service. The company claims Ignition Control makes better use of carrier network resources than might be made with traditional manual configuration of devices.

Ignition Control runs on Solaris workstations within service provider networks. It attacks the service definition and activation from several levels.

First, service level specifications are defined conceptually by code written in XML. Then resource-control software checks with network elements to assess whether the network will support the service. If the resources are available, software called Service Architect creates a Network Level Specification (NLS) that defines what technologies must be combined to deliver the service.

These NLSs are created by drawing on a set of software building blocks that define individual pieces of a service. For example, a service might require a 10M-bit/sec link between two sites. That requirement would be handled by a bandwidth-management building block, says Simon Crosby, the company's chief strategy officer. There are about a dozen such blocks in Ignition Control.

The NLS is then converted to vendor-specific instructions to activate the service.

CPlane has written code defining three services carriers can provide using the Ignition Control platform: Ignite Transparent LAN Service; Ignite VPN; and Ignite IP-Bandwidth.

To activate services, Ignition Control must be able to issue instructions to configure individual devices within a carrier's net, and these elements are typically created by many vendors. CPlane is working with eight to 10 hardware vendors to develop compatible software agents called Ignition Adapters. These adapters translate instructions from Ignition Control into commands that a particualr device built by a specific vendor can understand.

If a service provider has a device in its network for which CPlane has not written an Ignition Adapter, the provider can buy a tool kit to write their own.

Through adapters, Ignition Control also pulls performance data that it can feed to back-end software. This performance data also lets providers track how well their networks are performing based on the number of customers and services they support, Dave Passmore, a research director at The Burton Group says.

CPlane will compete against other software makers, including Dorado Software, Syndesis and Orchestream, that address service creation and activation.

Ignition Control will be available in the fourth quarter, and prices have not been set. However, prices will be based on then number of Ignite applications, the number of network elements and what kind of service and support providers order.

CPlane: www.cplane.com

PROFILE: CPLANE

Based: Sunnyvale, Calif.

Founded: 1998 by Nelu Mihai, CEO; Simon Crosby, Chief Strategy Officer; Ian Leslie, advisor.

Product: Ignition Control service creation/activation software for rapid service provisioning.

Financing: $35 million from ONSET Ventures, Pequot Private Equity, Amamrindo's Private Equity Group, CMEA Ventures, Woodside Fund and Sun.

Competitors: Dorado, Syndesis, Orchestream

Employees: 75

Fun fact: In 1992, Simon Crosby wrote software that controlled a Web cam monitoring a coffee pot in the faculty lounge at Cambridge University.

Short Takes

■ **Alidian Networks** announced the certification of its product line by **Removable Media Solutions**, Inc. as interoperable with storage-area network platforms from RMSI and Brocade Communications Systems. The interoperability testing was completed in RMSI's labs last week. RMSI certified Alidian's Optical Service Network (OSN) family of DWDM add/drop multiplexers to operate on a metropolitan network containing RMSI's SAN-in-a-CAN product or Brocade's SilkWorm family of Fibre Channel fabric switches. The OSN family includes the OSN 4200, the OSN 4400 and the OSN 4800. www.alidian.com; www.teamrmsi.com; www.brocade.com

■ **Atrica** announced the addition of Andy Ludwick, co-founder of SynOptics Communications and former CEO of Bay Networks, to its board of directors. Ludwick serves on the boards of Foundry Networks, Crossworlds Software and other private companies.

ONI helps speed deployment of new circuits

■ **BY TERRI GIMPELSON**

NEW YORK — ONI Systems last week said metropolitan service provider Sphera Optical Networks was able to turn up a 10G-bit/sec OC-192 SONET circuit for an unidentified carrier, using ONI's optical transport gear.

This could be a significant development in that it usually takes months to turn up lower speed SONET circuits. If two weeks provisioning time becomes the norm, new high-speed services could soon become commonplace.

Sphera claims it is also the first ring-based 10G-bit/sec deployment.

Sphera provided the circuit to the carrier to connect two carrier hotels in New York. The carrier uses Sphera's dense wavelength division multiplexing (DWDM) metropolitan ring, which is supplied by ONI.

Sphera uses ONI's ONLINE 7000 and 9000 transport boxes and OPTX management software. Sphera spent the last year evaluating gear from various vendors, including Nortel and Ciena, before selecting ONI.

The circuit was tested for two days before it was turned up Aug. 27, says Rohit Sharma, founder and CTO of ONI. He estimates there are between six and 12 other circuits on the Sphera ring.

Charlie Berger, technical analyst for The Gilder Group, says the DWDM ring is the key to the fast, disruption-free provisioning.

"It's important to understand that this deployment is a DWDM circuit that is running a SONET protocol," he says. "ONI's success here should serve as a notice that it's all about wavelengths and WDM and flexibility. You can only do all that with optics. If this were a [pure] SONET system, you would an entire forklift upgrade."

Berger also points out that the deployment took place while the carrier's system remained up and running.

"Nortel and Ciena would have had to shut down to make this type of upgrade," Berger says.

Separately, ONI announced a multimillion-dollar agreement with international data service provider Equant.

Equant plans to use ONI's ONLINE 7000, 9000 and OPTX software to light fiber that it has purchased for local point-of-presence interconnects to its long-distance wavelengths. ONI has begun deploying its equipment in the Equant network in London and Paris.

ONI: www.oni.com; Sphera: www.spheranetworks.com

www.nwfusion.com
More online!
The metropolitan networks architecture debate rages on.
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Introducing the RS 16000 from Riverstone Networks. It's the new generation of router built expressly for Gigabit and 10-Gigabit Metropolitan Area Networks. The chassis-based RS 16000 delivers up to 60 wire-speed Gigabit ports, along with 10-Gigabit Ethernet and CWDM uplinks all in 5 rack units – that's 70% more Gigabit ports per rack inch than the nearest competitor. For service providers, this means more revenue per rack and lower operating costs.

But the RS 16000 is more than the highest density router in the industry. As a full function, Internet-caliber metro-optimized router, it also delivers rich service creation capabilities. Through hardware-based MPLS, bandwidth carving, and extensive billing and accounting, the RS 16000 converts raw bandwidth into profitable services for carriers throughout the Metropolitan Area Network.

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WHEN FAILURE IS NOT AN OPTION

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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

Metatool bolsters root-cause analysis

■ **BY CATHY FULTON**

Every day, network executives face complex challenges managing the performance of WANs. However, there are simply too much data and too little time to address these challenges effectively. To resolve them, network executives need relevant, meaningful information to help identify the root cause of the performance problems.

New tools, called root cause performance systems (RCPS), are designed to correlate data from multiple sources to solve complex network performance problems.

An RCPS is a metatool that facilitates identification and correction of complex performance issues that occur across an enterprise-scale network. It operates on the global system rather than focusing on individual segments or units, and correlates information from vastly diverse data sources. An RCPS encompasses a full view of a network rather than a specific device or data source.

Traditional tools address problems by trying to simplify the data through TopN Reports: Top 10 protocols, Top 20 hosts, Top 25 SLA violations and others. Unfortunately, many important issues require correlating multiple variables obtained from different tools. While a TopN Report may provide a starting point, it is seldom the final point of data interpretation.

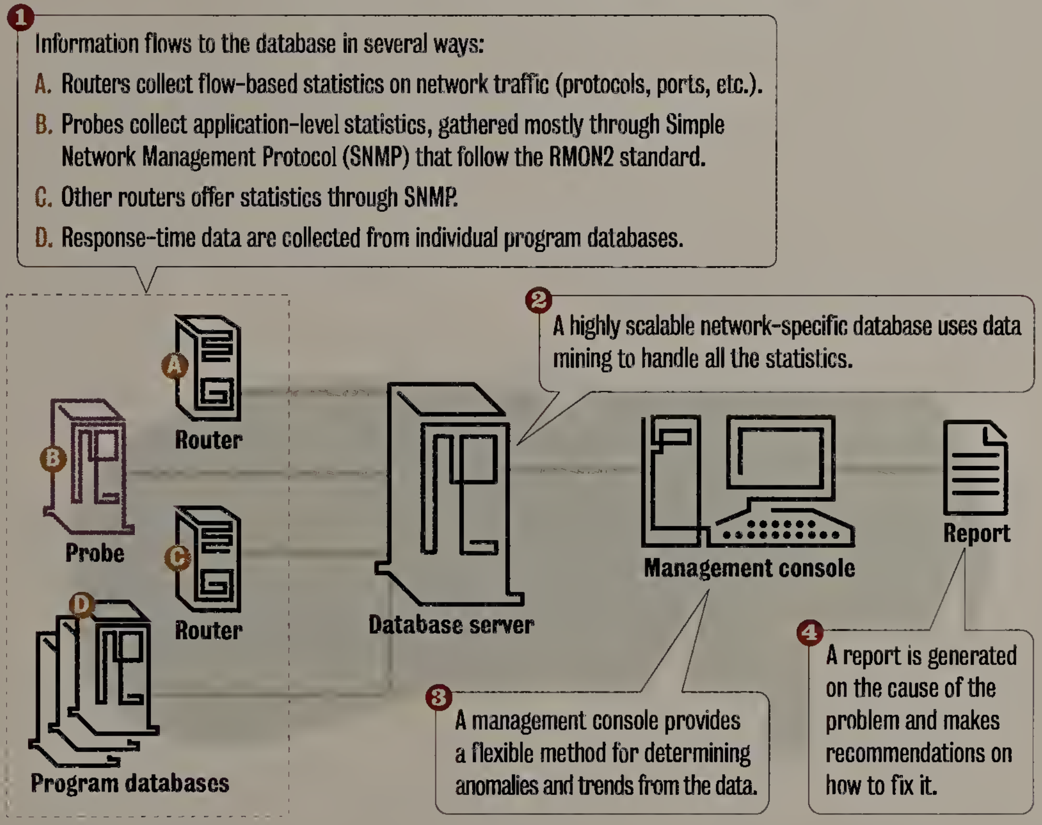
Because there is so much data to analyze, network managers need software that performs logical troubleshooting processes for them with useful recommendations for improving network performance. An RCPS handles this by correlating multiple data sets from a variety of tools, such as topology, configuration, MIB2, Remote Monitoring 2/NetFlow, response times, device statistics, protocol statistics and application statistics.

RCPSs go beyond traditional tools and mine the data to identify unusual and/or suspicious behavior, anomalous changes, excessive values or variations, underutilized resources, configuration issues, atypical patterns and other issues. It cross-validates data from different sources, and alerts on inconsistencies, and cross-correlates data for root-cause analysis. Upon isolating an issue an RCPS recommends corrective action.

■ **HOW IT WORKS**

Root Cause Performance System (RCPS)

RCPS correlates data from multiple sources to solve complex network performance problems.



① Information flows to the database in several ways:

- A. Routers collect flow-based statistics on network traffic (protocols, ports, etc.).
- B. Probes collect application-level statistics, gathered mostly through Simple Network Management Protocol (SNMP) that follow the RMON2 standard.
- C. Other routers offer statistics through SNMP.
- D. Response-time data are collected from individual program databases.

② A highly scalable network-specific database uses data mining to handle all the statistics.

③ A management console provides a flexible method for determining anomalies and trends from the data.

④ A report is generated on the cause of the problem and makes recommendations on how to fix it.

An RCPS typically taps directly into the SQL or flat-file databases of its sources so that information may be exchanged efficiently with minimal configuration — the RCPS can automatically discover much of the information it needs. If a company already has an SNMP poller, the RCPS would tap into the poller's database (via Open Database Connectivity or a small software push agent) rather than double-poll the devices.

Installation involves placing an RCPS slave component in each network operations center and pointing it to the different databases, then pointing a master RCPS component to the slaves. RCPSs require minimal configuration, but some tuning — defining logical aggregations and known dependencies — is recommended.

The differentiator of RCPSs is their problem-solving capability. They provide in-depth correlated analysis of network services and recommend improvements.

The purpose of an RCPS is to identify and resolve immediate and future application performance issues across an enterprise network. It is a performance analyst's primary investigative tool because it brings disparate data sources into a single interface. Whether a performance engineer is given the task of application deployment, resource optimization, performance diagnosis or technology evaluation, the information is readily available. RCPSs also search for problems and solutions independently, providing a dedicated resource to proactive performance management.

Fulton is executive vice president and CTO of NetQoS. She can be reached at cathy.fulton@netqos.com.

Ask Dr. Internet

By Steve Blass

How many end users can be supported by one desktop/network administrator? Is there any reference data, research or industrial standard that provides this information?

It can vary from 25 to 500, depending on factors such as the operating systems involved, the level of support provided, and whether the ratio in question involves front-line desktop support personnel or server and network infrastructure support staffing requirements. Each organization is different. The one consistent industry standard seems to be that there should be at least two qualified administrators on staff for each piece of equipment, so the organization can pass the "Mack truck test." (If one administrator is hit by a truck, you pass if it doesn't eliminate all the system administration expertise at the company.) Here are some Web sites that can help you determine the appropriate ratio:

- www.verber.com/mark/sysadmin/how-many-admins.html: General guidelines for approaching the problem based on the notion of support 'units,' with two examples of using units to calculate personnel requirements.
- www.rcs.ee.washington.edu/~jeffs/eeDeptPlan/ratios.html: A formula based on mean time to repair and mean time between failures for calculating the number of system administrators required to support a given network.
- www.compaq.com/products/ servers/management/idc/casemanage.html: Support requirement calculations based on support hours per month, per server.
- www.electronic-school.com/2000/09/0900f3.html: Claims the corporate standard is 50 PCs per administrator.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD
INSIDE THE
NETWORK
MACHINE

Mark
Gibbs

Back-, middle- and afterwords

Backwords: Going back to a Gearhead column on the sublime mysteries of DNS reverse mapping (www.nwfusion.com, DocFinder: 6030). A few weeks ago, reader Steve Hailey wrote:

"... The loopback network should actually be 127.in-addr.arpa, vs. 0.0.127.in-addr.arpa. 127 is a Class A network address, so the remaining octets are used to specify the host portion.

"As any 127 address can be used for the loopback, 0.0.127.in-addr.arpa would not work, say, for 127.55.55.55. Although it is common to see the reverse zone listed in the 0.0.127 fashion, in most of the technical information out there, it is incorrect."

Middlewords: This week, we have found yet another cool utility for keeping tabs on your servers. The product is KS HostMonitor by Alexander Kozlov (www.ks-soft.net/hostmon.eng/) and it is a great piece of engineering starting at $55.

HostMonitor is based on a simple idea: Provide a list of tests that can be applied to local and remote resources and services. Allow the tests to be scheduled and repeated individually, have individual consequences for success or failure, and produce reports in a variety of formats.

The tests available are pinging, testing TCP connections (any port) and carrying out a URL request (you can check the cyclic redundancy check [CRC] of the returned data or search the data for specific strings). You can also check free disk space, folder and file sizes, or just if a file or folder exists. Then you can check file integrity with CRC, verify a Universal Naming Convention path or compare files.

Then there's SQL server tests for Interbase, Microsoft SQL, MySQL, Oracle, PostgreSQL and Sybase; checking for running processes, services, local and remote NT events logs; checking CPU usage; testing SNMP devices; and even custom checks (that is, running your own tools external to HostMonitor).

You can also create custom messages and actions to alert you to the success or failure of events using what the author calls "macros" — really dummy variables that are replaced with the required data when the message is output.

Reporting is awesome. You can output on demand or automatically and report on failed events, successful events or both in a detailed or abbreviated format. The reports can be HTML, Windows Metafile Format (a format developed by Microsoft that consists of Windows-specific instructions to draw vector graphics, excellent for image interchange between Windows applications but useless on any other platform), or database file format.

KS HostMonitor . . . is a great piece of engineering priced starting at $55.

HostMonitor can also generate reports formatted for Wireless Application Protocol. So you can burn your money trying to connect to your Web site to find out the status of your monitored sites as you barrel down the freeway with one eye on the road and the other on an ugly minuscule screen, but we digress ...

We configured a free text-to-speech utility called ReadPlease 2002 (http://readplease.com/) to announce status changes. We used the macro feature to create custom spoken alerts, for example, "Oh darn, %HostName% using %TestMethod% has disappeared. Go get 'em Tex." (This gets translated to "Oh darn, myserver dot-com using URL request has disappeared" — you get the idea.)

HostMonitor also includes a built-in traceroute, a telnet client, an IP activity monitor, a log analyzer, an editor for test profiles (which also allows the setting of an attribute of multiple selections) and scripting (which allows quite complex test scenarios to be managed — particularly useful for monitoring a large collection of servers).

This is an excellent tool that garners nine out of 10 gear teeth.

Afterwords: Send 'em to gearhead@gibbs.com.

GEARHEAD RATING

Alexander Kozlov
KS HostMonitor

9

1=awful
10=insanely great

Cool Tools

Gizmos, gadgets and other neat stuff
Compiled by
Keith Shaw

Another phone for your Visor

The Visor Phone has some competition. Sprint PCS and AirPrime announced availability of the Sprint PCS Wireless Web Digital Link, the first Code Division Multiple Access Springboard module for the Handspring Visor. With the module, Visor owners can turn their Visor into a Sprint PCS phone operating on the CDMA network.

The Digital Link provides seven hours of talk time and 300 hours of standby time, and weighs about 3.4 ounces. In addition to making phone calls, you can access the Sprint PCS Wireless Web.

Once Sprint PCS begins the first phases of its 3G upgrade (likely early next year), Digital Link users will be able to access data with speeds up to 144K bit/sec.

The software upgrade to the Digital Link would be available with the nationwide launch of Sprint's 3G services in mid-year 2002. Pricing hasn't been announced yet, but the device should be available in Sprint stores or online at www.sprintpcs.com by the end of September.

Digital Link offers CDMA network coverage for Handspring Visors.

Color biz card scanner

CardScan 600c may finally convince you to take that pile of business cards sitting on your desk and scan them into your personal information manager. CardScan recently released Version 6 of the software along with the new color scanner. The 600c is 40% smaller than previous versions, is Universal Serial Bus (USB) only, and includes the following features:

- AutoMap: Clicking on a contact's address launches MapQuest, providing you with a map and driving directions.
- Signature card: Scan in your own business card to be used on Outlook e-mails.
- CardScan.Net: Online address book so you can access your contacts from any Web browser.

The 600c costs $300. For more information, go to www.cardscan.com.

CardScan 600c lets you scan color business cards.

Listen to books on a Visor

Handspring Visor owners can buy a module that plays Audible's collection of downloadable audio editions of books, newspapers, magazines, radio shows and original programs. The Audible Advisor Springboard module for the Handspring Visor contains 16M bytes of storage capacity, and can store and play back more than 4.4 hours of Audible's Internet-delivered audio. The Advisor costs $130. However, you can also buy the Advisor for $50 if you participate in Audible's BasicListener flat-rate monthly membership LAN for one year ($12.95 per month). The program lets you download any audio book from the Audible collection (currently more than 3,500 titles), as well as a subscription to one audio version of a newspaper, magazine or radio program (currently more than 25).

For more information, go to www.audible.com.

Memorex ships DVD media

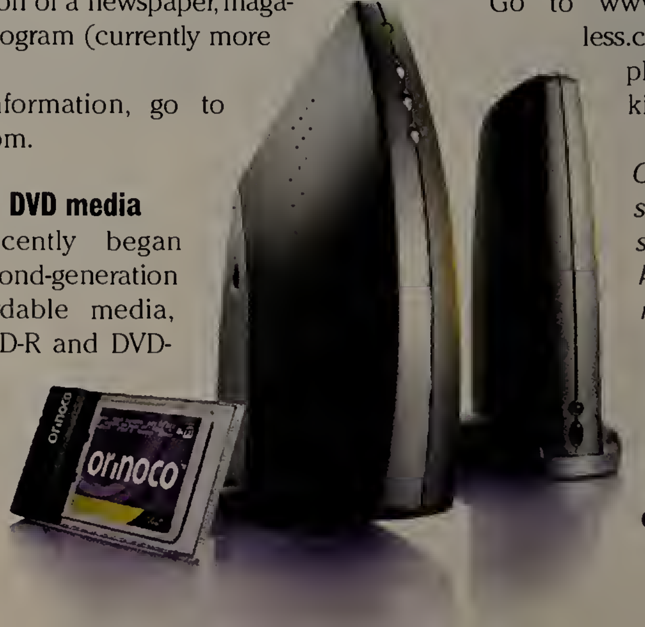
Memorex recently began shipping its second-generation of DVD recordable media, both in the DVD-R and DVD-RAM formats. The new DVD-R product will hold 4.7G bytes of data and cost around $20. The DVD-R disc is a single-sided, "general use" type with write-once capability. Of the two types of DVD-R media (General Use or Authoring), General Use will be compatible with most new video DVD recorder/players, and newer DVD-R computer writers. The DVD-RAM products will be offered in a single-sided 4.7G byte and 9.4G byte formats, and cost $35 and $40, respectively.

802.11b in a box

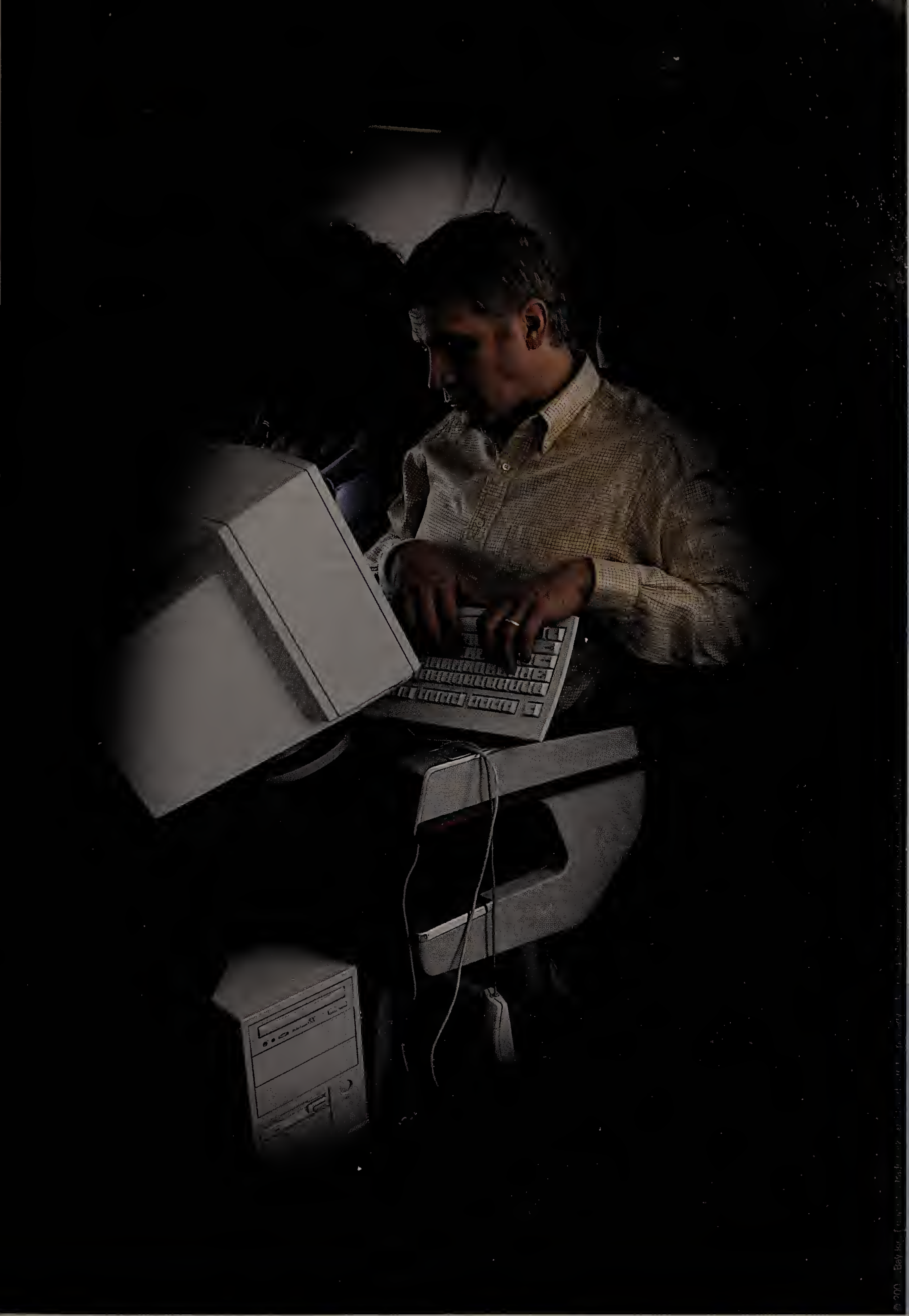
Agere Systems wants to make it easier to set up a wireless network. The company has announced availability of wireless Internet access and networking kits for small businesses and home offices that provide a complete 802.11b (Wi-Fi) wireless network in a box. The kits include an access point and at least one PC card or USB client device for desktops, and range from $350 to $750.

Go to www.orinocowireless.com for a complete list of the kits.

Got a cool device, software or Web site? Let me know at kshaw@nww.com.



Orinoco gives you an access point and PC card all in one package.



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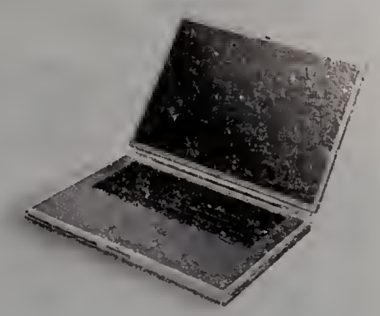

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EDITORIAL

John Dix

The attack as seen from Interop

I'm writing this on a 22-hour bus ride from NetWorld+Interop 2001 in Atlanta back to our home office in Southborough, Mass., just west of Boston.

The show was largely shut down for the day at 2 p.m. Tuesday in response to the terrorist attacks that morning in New York and Washington, D.C. Although the show was scheduled to open per usual Wednesday, some companies — including ours, Microsoft and Intel — were packing up their booths and leaving. *Network World* parent company IDG chartered a bus to take 25 of us home.

Despite the sheen of normality at the show Tuesday morning, with booth criers doing their thing and people milling about talking — some about the events of the morning, some about technology, more about the events of the morning — it was clear no one could focus.

People were filtering onto the show floor, but the most heavily traveled booths belonged to the vendors that used their Internet connections to tune their big-screen monitors to CNN. Even though the audio and visual was often fragmented and interrupted, the throngs were desperate for information.

By late morning Tuesday, CNN's headquarters across the street from the convention center was closed to the public. Police manning the street between CNN and the convention center wondered aloud why the seemingly educated people at the show hadn't scattered to the wind. After all, it was unclear at that point how many locations might be targeted.

The city, however, urged show organizer Key3Media to keep the event going. With each passing hour that seemed more ridiculous, and Key3Media responded by canceling the keynotes and then, a short while later, closing the exhibit floor so people could go catch up on the news and check on the well-being of friends and relatives.

In one of the few meetings I was able to squeeze in, the subject of the attack came up in an eery way. Halfway through a conversation I was having with the CEO of a young company, he said, haltingly, that most of his early customers were in the financial market and many were housed in the towers. It was clear he was worried about the safety of his contacts and equally clear that the future of his company might be at stake.

That moment crystalized the fact that it will be a long time before we realize all the trickle down implications of this attack.

— John Dix
Editor in chief
jdix@nww.com

Grid and bear it

Scott Bradner wrote a nice and admirably skeptical column regarding a recent *New York Times* story that proclaimed grid computing to be the "next phase of the Internet" (www.nwfusion.com, DocFinder: 5973). However, I take issue with some of his points.

Like the *Times* story, Bradner focuses on a narrow view of grid computing as the "harnessing of idle computers" and is doubtful that this limited goal has much relevance beyond a niche market. Yet the grid folks themselves (and I am one) take a more expansive view, defining the grid problem as being concerned with the "controlled sharing and coordinated use of geographically distributed resources" (see www.globus.org/research/papers/anatomy.pdf). To address this problem, grid technologies such as the widely used Globus Toolkit address issues fundamental to distributed resource sharing, such as single sign on, delegation, community policy, resource discovery, remote resource access and resource co-allocation.

Bradner also doubts that grid technologies can be useful even in the narrow sense of harnessing remote computers due to the difficulties inherent in compensating owners of idle systems. This view would be a surprise to established companies such as Platform Computing, which sells resource management products for harnessing computers in companies, or to start-ups such as Entropia, which produces technologies akin to those used in SETI@home for use within the enterprise.

Bradner concludes by suggesting that grid technologies run the risk of duplicating the Distributed Computing Environment experience, with management costs outweighing benefits. This is clearly a risk of which all involved need to be aware. However, we have also learned a lot in recent years, and the fact that grid technology projects are already generating Internet drafts suggests that at least one pathway to technology implementation is understood. Whether this will transform the Internet remains to be seen, but I am confident that grid concepts will have a significant impact on many aspects of computing and communications.

Ian Foster
Associate division director
Argonne National Laboratory
Argonne, Ill.

Don't count on cable

Regarding "Cox touting 'managed' cable VPN" www.nwfusion.com, DocFinder: 5974):

My wife telecommutes, and she uses Cox's Road-Runner service in Fairfax, Va. The connection is usually down about 5% of the time, but recently had been offline more than half the time. The automated trouble desk normally had no information, but when she held for a technician, she was told there was a known problem in her area.

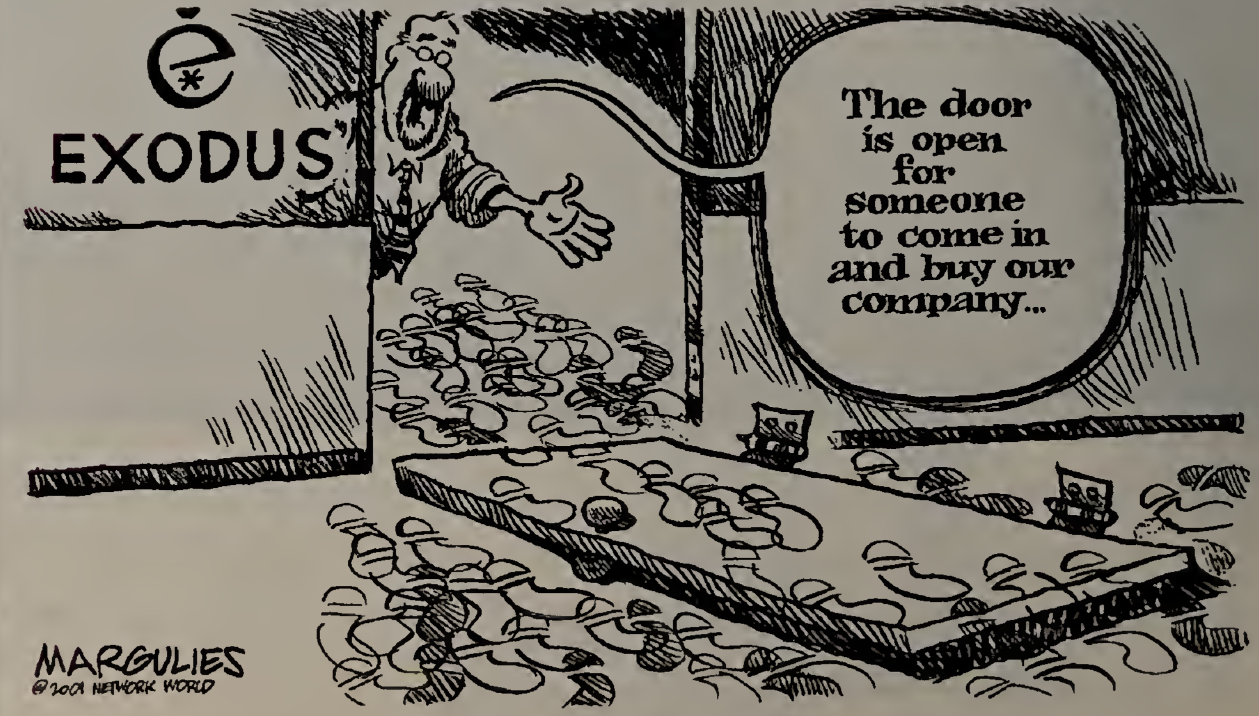
On one occasion, I got online with a technician who suggested that the problem was with the firewall that I installed. I couldn't see why the firewall would suddenly start causing problems, but removed it. Service did not improve. The next day I read in the trade press that a virus had infected the Cox routers. So even though Cox knew they had a problem, they not only blamed my equipment, but also had me disconnect the protection I did have.

The kicker with this recent rash of disconnects is that when my wife complained about the effect of the poor service on communication with her customers, the technician told her that she should not count on cable for business use. If Cox believes that, then I believe that. Cox VPN is definitely out.

Michael Cardinale
Springfield, Va.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

More online! www.nwfusion.com Find out what readers are saying about these and other topics. **DocFinder: 5923**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INTRANET ADVISER

Daniel Blum

Hidden cost of 'free' directories

Basic directory service is becoming a free commodity. However, deploying directories is seldom trivial, and software costs can be the least of your problems.

Continuing a trend Microsoft started by bundling Active Directory into Windows 2000, Novell offers eDirectory royalty-free to OEMs for up to 250,000 users, and Sun bundles the iPlanet Directory Service without charge for organizations with about 200,000 directory entries. IBM and Oracle also bundle their directories with other products.

But often, your free "basic directory" becomes an "advanced directory" requiring extra payments to the vendor. The first and most obvious issue is size. Even if your organization has fewer than 200,000 users to list in the directory, other objects such as printers, groups, organizations and cost centers can increase directory size. And e-business directories often contain information about thousands, or millions, of customers.

What happens when the directory gets past 200,000 or 250,000 users? With Sun or Novell, the asking price is about $2 per user, but you should be able to get that down to a site license totaling 10 cents or less per user in very large deployments. Microsoft publishes Internet Connector pricing that lets customers support an unlimited number of nonemployee Internet users on a given Internet server, starting at about $2,000 per server. The pricing is much more affordable than we've seen in the past, but with very large directories, software costs still add up.

Moreover, a generalized directory supporting multiple applications doesn't live in isolation; it needs to be connected to diverse data sources through metadirectory technology. Microsoft requires a consulting contract before customers can use its Microsoft Metadirectory Services. Sun, Novell and other vendors also charge for their metadirectory products.

Even with discounted software costs, deploying a directory remains far from free or easy. Especially when you plan a companywide directory or a general-purpose e-business directory for multiple applications, costs of services, deployment and support remain high and timeframes to deploy often as long as six to 18 months, including the whole process from planning deployment through migration.

In addition, the gap between the time a directory project starts (the hype) and the time it is successfully completed (the reality) can leave applications hanging. Often, line-of-business applications must go forward in parallel with directory projects using embedded and duplicative directories, which only add to the integration problem.

A start-up called OctetString recently announced a Virtual Directory Engine (VDE), which helps application vendors and users deal with the time gap. With an OEM license, vendors can use OctetString's own directory repository as an embedded directory, then later use the VDE as a proxy to tie into a completed directory.

All things considered, directories are moving in the right direction, but time and money can still be problems. So when your local vendor or consultant comes around promising a "free" directory, be sure to look the gift horse in the mouth.

Blum is senior vice president and research director with The Burton Group. He can be reached at dblum@tbg.com.

Even with discounted software costs, deploying a directory remains far from free or easy.

TELECOM CATALYST

Daniel Briere and Beth Gage

Coming soon to a store near you

As more and more telecom companies continue to experience the sickening feeling of stock value free-fall, we are beginning to see an interesting trend emerge. It seems some of these companies are taking the old adage "think outside the box" way too literally. Thanks to our devoted readers (all 42 of you), we have been given a sneak peek at some of the new business models, product ideas, or business directions these companies are considering. Keep in mind that this is top-secret information, so blame us if some of these products never happen.

The first batch of new products targets offerings from giants such as Procter & Gamble, Johnson & Johnson and other personal care product industry leaders. Watch your store shelves for these new items:

- From ViaGate and ViewGate, new toothpastes to give Colgate a run for its money. From AirnNet, another new toothpaste attempting to move ahead of them all.
- From Occam Networks, the new "Occam's Razor — Remote Shaving Terminals."
- From Redback Networks, a soothing lotion to relieve sunburn pain.
- From Sheer Networks, high-quality pantyhose.

Not content with ruling the telecommunications industry, the following companies sound as if they're looking to attack Americans where it counts the most — our stomachs. We are not sure if any of these items will catch on, but if they do, you saw it here first.

- From FiberNet, a cereal promising to keep industry leaders "regular."
- From Hyperchip, a new potato snack loaded with caffeine for software programmers.
- From Satmex, south-of-the-border food you can prepare at home.
- From Cisco, a new shortening to compete with Crisco (launching with a commercial jingle by rap star Sisqo).
- From Maple Optical Systems, a new line of syrup technology that pours more quickly than any other, even when cold.
- From Celox, a new antacid tablet to take after reading the morning stock reports.
- From Teleware Network Systems, plastic food storage units that put Tupperware to shame.
- From Chevin, a new cocktail that combines Chivas Regal with just a twist of Seven-Up.

Recognizing that many of their employees could be a prime, target-customer base for a new product or service, the following telecom companies want to jump into the sports and leisure market. Look for these products at your local sporting goods, department and toy stores:

- From Sprint and BroadJump, track-and-field running shoes and equipment designed to capture market share from Adidas and Nike.
- From ReefEdge and Wave Rider, gear for the hip surfer dude.
- Because America can never have too many star-gazing magazines, Telus is launching its eponymous publication — the latest competition to *The National Enquirer* and *People* magazine.
- Ticketmaster will now face competition for AT&T and VBT's new joint venture, Concert.
- Looking to be the next e-Bay, Gotham Networks will rebrand itself with the tag line: "A clear path to Batman collectibles."
- The proposed partnership of Tenor Networks, Overture Networks and VocalData will build brick-and-mortar music stores specializing in instruments and voice lessons, and equipment for telecom geeks.
- From YadaYada, a new chat hotline service for the teen set.

We are sure there are many more companies struggling with hot new ideas such as these. Tell us what "secret" new products your company is developing as a last-chance effort to stay alive.

Briere is CEO and Gage is vice president of TeleChoice, a telecommunications consultancy. They can be reached at telecomcatalyst@telechoice.com.

Keep in mind that this is top-secret information, so blame us if some of these products never happen.

Tito Ade-Adisa, Senior Systems Engineer, **Honda Research and Development**

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Can Ethernet go end to end?

IEEE group pushes for carrier-grade Ethernet to compete against DSL, cable modem and SONET.

BY DOUGLAS RUBY

The idea that Ethernet could become as ubiquitous and cost-effective in public carrier networks as it already is in private networks is the driving concept behind an IEEE study group on "Ethernet in the First Mile."

The EFM study group, a precursor to full-blown standards activity within the IEEE, is developing standards for carrier-grade Ethernet that could be deployed as a low-cost broadband alternative to DSL and cable modem, and as a replacement for SONET.

If the group's efforts are successful, carriers would be able to save money by deploying Ethernet-based capital equipment, which is less-expensive than ATM or SONET switching gear. Network executives would reap the benefits of less expensive customer premise equipment for WAN connectivity. And both businesses and consumers would benefit from broadband access that would cost less, be easier to get and offer more bandwidth than DSL or cable modems.

Before all of this can happen, there needs to be a fundamental change within Ethernet. While several competitive local exchange carriers (CLEC), such as Yipes, Telseon, XO Communications, Cogent and Fiberstreet, are deploying Ethernet-based public networks, the key will be convincing the traditional carriers that Ethernet has the operations, administration and management features necessary to be considered a carrier-grade transport technology.

To address those issues, the study group is defining carrier-grade Ethernet for three topologies: long-distance, point-to-point single-mode fiber; voice-grade copper loops; and passive optical networks. In addition, operations, administration and management enhancements, such as remote monitoring, remote loopback and remote failure indication, are being worked on.

"I see the change to Ethernet in carrier networks occurring fairly gradually at first, but that won't last long," says Jonathan Thatcher, chair of the IEEE's 802.3ae 10G Ethernet standards group and principal engineer at World Wide Packets.

"The incumbents will eventually be driven to go to Ethernet by competition, availability of low-cost carrier grade products, improvements to the standards and most significantly, by demand from large corporate customers," he adds.

Why Ethernet

Today, Ethernet rules the LAN, while SONET is the dominant transmission technology for the public WAN. So, in order to route Ethernet-based TCP/IP traffic into or out of the public WAN, some form of translation, such as ATM, packet over SONET, DSL, cable-modem or serial point-to-point high-level data link control encapsulation is required.

Because more than 95% of Internet communications begin and end as Ethernet formatted frames, the idea behind EFM is to use Ethernet instead of SONET as the primary transmission technology for public multiservice networks.

STEVEN LYONS

New developments

Ethernet traditionally has been a private LAN topology supporting point-to-point distances up to .062 miles over unshielded twisted pair copper wire, up to 1.2 miles using multimode fiber optics, and up to 3.1 miles using single mode optics, at speeds of 10M, 100M and 1,000M bit/sec.

However, during the past five years, advances in optical technologies combined with removal of the "collision domain" limitations of true carrier-sense multiple access with collision detection operation have allowed Ethernet to stretch

When will it be ready?

After a "Call for Interest" in November 2000, the IEEE 802.3 EFM study group began its efforts in January. This study group is expected to transition to a full standards effort as the IEEE 802.3ah Ethernet in the First Mile (EFM) this fall. While it is still early in the standards process, if EFM is able to complete its work on schedule, we would expect to see a "ballot-ready" draft document from IEEE 802.3ah EFM by January 2003.

to many tens of miles over single mode fiber (even over a single fiber).

Also, recent efforts within IEEE 802.3 on 10G Ethernet as well as in International Telecommunication Union activities in X.86 and generalized frame processing have attempted to define how to put Ethernet frames into a SONET wrapper for transmission over the public WAN backbone.

Physical layer technologies already standardized for ANSI T1E1.4 very-high bit rate DSL (VDSL) can also be borrowed and adapted to provide high-speed (10M bit/sec and above) Ethernet over voice-grade twisted pair cabling at distances longer than .49 miles.

The carrier perspective

At first glance, there may not be a huge incentive for incumbent carriers to change from a SONET model to an Ethernet transmission model because providing more bandwidth at lower costs is not necessarily in their best interests.

However, there are immediate and powerful incentives for their most profitable segment — large multinational corporations — to force these carriers to provide Ethernet-based access services.

For example, a carrier executive who didn't want his name used says, "If we deliver a 45M bit/sec DS3 to the corporate premise, it will cost our customer around $50,000 [$25,000 per end] in capital expense for DS-3 interfaces and $42,000 per year in WAN support staff costs to support that connection. If we deliver a 100M bit/sec Ethernet to the site, use flow control or traffic shaping to limit it to 45M bit/sec, and charge the same monthly rate, we can still help our customer save lots of money. The customer's capital cost to connect to the 100M bit/sec Ethernet link drops to around $400 [$200 per end] and the staffing cost is $24,000."

The carrier executive adds, "In a reference design that we did for a hypothetical virtual private line central office service, we designed it using Ethernet switching, ATM switching and traditional SONET circuit switching. Ethernet was cheaper by a factor of 3-to-1 over circuit switches and by a factor of 10-to-1 over ATM switches."

But he added that Ethernet was still too immature to deploy because there is not enough operational and management capability provided by the underlying technology.

Ethernet must become more robust if it is to be successful in the carrier marketplace. Carriers must be able to ensure the integrity of their networks and meet customer service-level agreements without fundamentally impacting customer traffic.

Basic features that have long been taken for granted in SONET, such as remote loopback, and link statistics, have not existed within Ethernet at all. The EFM study group is addressing these issues, but the specifics of how to do this have not yet been agreed. There is debate on whether to do these functions completely out of band from the bearer traffic or whether to try to leverage the rich set of in-band SNMP-based statistical and diagnostic capabilities developed for the enterprise Ethernet market.

Ethernet to the home

The real prize for Ethernet may be residential broadband services. With more than 120 million residences in North America, only about 5% are currently subscribing to any form of high-speed (more than 300K bit/sec) broadband Internet service.

The deployment and adoption rates for DSL and cable-modem services have been frustratingly slow for many potential customers. This process has been further complicated by the financial failures of a number of DSL-based CLECs. Finally, by the time currently planned DSL and cable networks are finally deployed, future performance enhancements required for broadcast video, HDTV, Web access and home entertainment services may be well beyond the scalability and capability of those deployments.

"I see the subscriber access network as the last horizon for Ethernet. We have done 10M bit/sec, 100M bit/sec, 1,000M bit/sec and now 10,000M bit/sec. The cost of Ethernet switching is dramatically lower than competing technologies such as DSL and ATM. Further, with support for running Ethernet on low-quality voice-grade copper at much longer distances than 100 meters, new opportunities will open up in 'unstructured' wiring at hotels, older office buildings, hospitals, airports and multitenant units," says Howard Frazier, chairman of the IEEE 802.3 EFM effort.

Frazier adds that the price/performance ratio of Ethernet-based equipment for residential broadband services can be two orders of magnitude better than current DSL equipment. And DSL requires an ATM backbone, which is more expensive than an Ethernet backbone. "So the cost of the whole network infrastructure can be less in absolute dollars at the same time it delivers much higher performance to the subscriber," Frazier says.

Vendor push

More than 77 companies and 125 people attended the March EFM Study Group meeting, with as many as 200 attendees at the May meeting in St. Louis. Vendors included Cisco, Nortel, Intel, Alcatel and Lucent, plus many newcomers.

Cisco is shipping a Catalyst switch that uses a proprietary implementation of Ethernet VDSL to deliver up to 15M bit/sec over voice grade copper cable at distances up to 5,000 feet. This so-called long-reach Ethernet is being targeted at hotels and other multi-unit buildings.

"But for this technology to be truly disruptive, which we believe it can be, it must be standardized," says Bruce Tolley, manager of emerging technologies at Cisco.

Ruby is a 28-year veteran of the computer and data networking industry. He recently retired as vice president and CTO of Avaya's Enterprise Internetworking business. He can be reached at druby@charter.net

The standards effort is focusing on three areas:

■ Long-distance, point-to-point optical Ethernet — The technical objective is to standardize operation of 1,000M bit/sec (1000BaseX) Ethernet over a single fiber (instead of a fiber pair) at a distance greater than or equal to 6.2 miles. This new fiber-optic physical layer interface could be used to provide lower cost, single-mode optical interfaces, using half the amount of fiber currently required for Gigabit Ethernet at distances twice that currently specified by the standards. State-of-the-art 1300nm and 1550nm single-mode optics will be leveraged to support this work. This will be a relatively minor enhancement to existing Ethernet, using technology that is generally considered to be low risk. This kind of connection would be most applicable to high-speed corporate networks.

■ Voice-grade copper Ethernet — The technical objective is to support point-to-point distances greater than or equal to 2,500 feet at speeds greater than or equal to 10M bit/sec. Technical presentations have shown operation at speeds near 50M bit/sec for shorter distances with operation at lower than 10M bit/sec speeds at much longer distances. While some study group members want to just "steal" the physical layer specification developed for ANSI T1E1.4 very-high bit rate DSL, there are also other proposals that will meet this requirement. This activity will likely require more work than long-distance optical fiber, but in the true spirit of Ethernet it will "borrow" from past work.

■ Passive optical Ethernet — Perhaps the most aggressive and controversial of the three topologies being considered, the Ethernet Passive Optical Network (EPON) technical objective is to develop an 802.3 compatible physical layer interface for operation at 1000M bit/sec, at distances greater than or equal to 6.2 miles, with support for at least 16 or more end points, in a shared, point-to-multipoint topology. EPON expects to borrow heavily from work already done within the post, telegraph and telephone administration-sponsored Full Service Access Network (FSAN) consortium. A passive optical network (PON) uses a single fiber from the central-office head end (or other active location) to service 16 to 32 end points. The optical signal would be split by one or more "passive" splitters mounted midstream in the network. In this topology, any end point could "receive" downstream traffic from the head end at up to the full 1,000M bit/sec, but would have to share the "upstream" bandwidth with up to 32 other nodes, thus limiting its share to about 30M bit/sec. The PON architecture has inherent advantages in that less fiber is required to service more users, plus power is not required in manholes, on poles, or at the curb. PONs may also have a lower-cost electronics structure, however, given the still declining cost of very inexpensive Ethernet switches, it is not entirely clear that this will continue to be the case.

Unfortunately, unlike the ATM PONs defined in FSAN, Ethernet operation over point-to-multipoint networks is currently undefined. Architecturally, Ethernet interfaces today expect the underlying network to be based on either point-to-point links or a shared peer-to-peer topology. Without more work, the EPON will "break" certain behaviors that higher layer protocols such as IEEE 802.1 bridging and others expect. Thus, it is expected that more work will be required to define the EPON than the prior two.

STEVEN LYONS

Scoping out the GigE MAN vendors

New players offer inexpensive, flexible broadband links.

BY DAVID AXNER

If you're looking for an alternative to pricey and inflexible T-1 connections to the Internet, or if you want to build a campus or metropolitan-area network without making a capital investment, one option is a Gigabit Ethernet-based MAN vendor.

Newcomers such as Telseon, Yipes Communications and Cogent Communications are offering inexpensive broadband links that can be provisioned quickly, plus they offer access to value-added services from network service providers, including application hosting, storage services and Web hosting.

They can also connect companies throughout the U.S. or globally over WAN broadband optical links that interconnect MANs. In addition, these vendors are bringing fiber directly to customers within multitenant buildings by connecting to the building's vertical riser. Ethernet is the dominant access method, which enables multitenant building customers to connect directly to their building LAN.

The network design looks like:

- Gigabit Ethernet switches aggregate customer traffic and connect to routing switches in the core network using optical lasers over single-mode fiber-optic cable.
- SONET, dense wavelength division multiplexing (DWDM) or Gigabit Ethernet runs in the core network. Gigabit switches connect directly to SONET switches through Packet over SONET interfaces for existing SONET installations. (When 10-Gigabit switches become available, they will provide direct SONET connections at OC-192.)
- In new installations, vendors are using Gigabit Ethernet switches with optical interfaces in the core network. Trunking (link aggregation) is deployed for switch-to-switch connections for increased bandwidth.
- DWDM allows vendors to support multiple channels on a fiber pair. A full-duplex Gigabit Ethernet link requires a fiber pair for each 2G bit/sec channel. DWDM can combine up to 16 channels on a fiber pair, and in the near future, up to 32 channels, which eliminates the need to deploy or purchase multiple fiber pairs.
- Coarse WDM (CWDM) supports fewer channels (usually four or eight) that are spaced wider across the WDM frequency spectrum than DWDM, but it is less expensive than DWDM. Some vendors find this option more cost effective.

The players:

- Cogent Communications, headquartered in Washington, D.C., targets commercial customer premises in major metropolitan areas nationwide. It addresses users within a multitenant building who need broadband access to the Internet or who need broadband connections to locations within the same metropolitan region or in another city supported by a Cogent MAN. It provides 100M bit/sec access to its network.

Cogent's nationwide network is an end-to-end IP-based network. Its backbone runs at OC-192 (9.952G bit/sec) over fiber and interconnects its MANs in at least 20 U.S. cities. Cogent's MAN rings run at OC-48 (2.488G bit/sec). While Cogent uses long-haul DWDM to interconnect its backbone nodes, it uses CWDM for its MAN rings. Each fiber strand within Cogent's fiber cable supports up to 128 separate channels.

- Telseon, based in Palo Alto and Denver, has deployed MANs in 20 major U.S. cities and 60 data centers. While Cogent and Yipes target enterprise customers, Telseon targets service providers, which use the Telseon infrastructure to provide services to enterprise customers.

Telseon's strategy of supporting multiple service on its MANs benefits enterprise users by providing them with a range of services from multiple service providers. They can contract with several service providers for different types of services provided at the same point of presence.

Telseon provides its standard service dubbed Ethernet IP, which is priced on bandwidth and distance; and its other service, called Metro Wave Service, is protocol independent and provides its service-provider customers direct connections between two network locations within a metropolitan area at 2.5G bit/sec and 10G bit/sec over DWDM. This service supports data, voice over IP and Internet traffic. The service provider who contracts Telseon for this service can demux the bandwidth and provide connections via its own access equipment to companies over legacy circuit switching technologies, such as T1/E1 and T3/E3.

Telseon says it negotiates the price of this service on a case-by-case basis. Pricing depends on volume, geographical factors and user requirements. Telseon offers its service provider customers three types of network connections: point-to-point, point-to-multipoint and multipoint-to-multipoint.

- Yipes, located in San Francisco, provides broadband LAN-to-LAN interconnect service, called Yipes MAN and Yipes WAN, and a LAN to Internet access service it calls Yipes NET. Yipes' network is IP-based end to end. Yipes MAN is protocol insensitive and can accommodate any Layer 3 protocol. However, Yipes WAN is an IP transport service, which limits traffic to IP protocol. It also restricts transport speed to between 1M bit/sec and 80M bit/sec. Yipes secures its MAN service as a VPN. Its WAN gateway, a VPN device provided by NetScreen Technologies, supports Triple-DES and packet authentication.

Yipes also offers a managed firewall service (Yipes WALL) for its Yipes NET subscribers. Yipes WALL includes a firewall device (rated at 100M bit/sec maximum) from NetScreen configured to a customer's specifications. Yipes installs the firewall at the subscriber site. It includes a firewall monitoring service provided by Yipes partner, Riptech, which provides its Security Operations Center from which security analysts monitor customer firewalls on a 24-7 basis.

Delivering the goods

Cogent subscribers get a dedicated 100M bit/sec Fast Ethernet connection for a flat rate of $1,000 per month. Cogent brings its fiber cable directly to the building at no cost to subscribers, and connects to standard Category 5 risers within the building. At the subscriber's LAN, the Cogent access cable plugs directly into the RJ-45 port on a Fast Ethernet network interface card.

Telseon customers currently average 50M bit/sec of bandwidth for the initial order, but many quickly move up to 70M bit/sec or more. Telseon customers can easily provision their network because it is an Ethernet, IP-based network. A Telseon browser enables users to instantly gain more bandwidth by "a click of their mouse" button. Telseon calls this feature "instant scalability." Telseon customers can scale their bandwidth from 1M bit/sec up to 1G bit/sec in just 10 seconds. Telseon's scalability has a granularity of 1M bit/sec.

Yipes delivers its service to subscribers via a direct fiber connection between its MAN and the customer premise. Like its competition, it connects its service directly to a 10/100Base Ethernet RJ-45 port on the customer's LAN. Yipes subscribers can scale their bandwidth from 1M to 1G bit/-sec in 1M-bit/sec increments. But, changing bandwidth is not instantaneous. Customers must contact Yipes with their requested bandwidth change, which is executed by the next day.

The vendors behind the vendors

Cogent's network is Cisco-based. It is constructed around Cisco's ONS 15454 and ONS 15800 Optical Network Switches and its 12016 Gigabit Switch Router (GSR).

Telseon constructs its networks with Gigabit Ethernet switches from Foundry Networks and Riverstone Networks. Foundry's BigIron switches are used in Telseon's core networks located in higher-density cities, while Telseon uses Riverstone service interface units and access switches in all of its networks and Riverstone's core switches in Telseon MANs not supported by Foundry. Extreme, ONI and Cisco are also equipment suppliers to Telseon.

Telseon's core network is optical and uses long-range Gigabit Ethernet Interface converters (GBIC) and DWDM to interconnect switches over single-mode fiber cable. Multiple links interconnect switches and DWDM will eventually support up to 10G bit/sec on each wave, which provides high scalability and redundancy for network resilience.

Telseon has been deploying CWDM technology to scale-up its networks and leverage the use of installed fiber cable. CWDM is more cost-effective in MANs, where fiber cable runs are limited to the metro area, than DWDM equipment designed for long-haul networks. Telseon plans to deploy 10 Gigabit Ethernet switching for its core when it becomes available.

Yipes has several partners that support key components of its network. Yipes partnered with Metromedia Fiber Network to deploy fiber cable in major U.S. cities served by Yipes. Yipes also has partnerships with major IP backbone providers, such as Level 3 Communications and Qwest Communications to transport packets over their WANs between its geographically dispersed MANs. Yipes uses Extreme Networks Summit and Black Diamond switches for its MANs and Juniper M40 routers for its optical network core and M20 routers for differentiated services at the edge.

How to choose

Prospective users of service providers should select a service provider based on the provider's geographical coverage, its growth plans and its service-level agreement (SLA).

A SLA should guarantee successful installation on the date it specifies, the bandwidth and service availability that the customer specifies, and the percentage of network availability, packet latency, and packet-loss delivery specified by the SLA.

Service providers that connect directly to the customer premise eliminate last mile costs for the subscriber and make it easy for subscribers to access their service. Subscribers should be able to immediately upgrade their service bandwidth according to their need, for example, "with a click of their mouse button."

Network availability should be 99% and packet latency should be minimum for packets that conform to the SLA. For example, Telseon claims an average latency of 1.5 msec for its Standard Data Service. Also, packet loss ratio — the number of lost packets divided by the number of transmitted packets — should be less than 0.01%. Telseon rates its rate as 0.004% for its Standard Data Service. The subscriber should also be able to upgrade the SLA according to need. All these objectives need to be met for successful network service.

The key players

	cogent COMMUNICATIONS	TELSEON	yipes that's fast!
Services provided	Internet access and LAN extension	Ethernet IP service and Metro Wave Service	Internet access, LAN extension, and firewall service
Access bandwidth	1M to 1G bit/sec in 1M bit/sec increments	1M to 1G bit/sec in 1M bit/sec increments	1M to 1G bit/sec in 1M bit/sec increments
Charges	$1,000 per month for 100M bit/sec; $10,000 per month for 1G bit/sec	$5,540 per month for 150M bit/sec plus $800 for two router ports	$1,000 per month for 10M bit/sec, $2,100 per month for 50M bit/sec or $3,000 per month for 100M bit/sec

Axner is president of DAX Associates, a network analyst and consulting firm in the Philadelphia area that produces a Gigabit Ethernet market study called 10 Gigabit Networks. He can be reached at daxner@adelphia.net.

IP telephony's soft underbelly

TESTER'S CHOICE
Edwin Mier

A week doesn't go by without some enterprise networker asking us: So what can IP telephony do for me that the current digital-PBX lot can't?

As it turns out, the promise of IP telephony remains just that, more of a promise than instant gratification.

In time you'll be able to run all your traffic over a single network, yank out those expensive leased trunk lines, greatly simplify management of the whole enchilada, and eventually cut costs. But what does it get you today?

Some vendors of IP telephony are making headway with customers via the "soft" sell. By sending real-time voice through an IP network, software can then handle, manipulate and process it as data. Call it either computer-telephony integration or convergence, it means that new applications can consolidate aspects of voice and data in ways not previously possible.

Consider unified messaging. Most who have worked with a unified-messaging system appreciate the user productivity gain that comes from accessing voice mail and e-mail concurrently through the same interface.

Then there are "soft phones," which, for the uninitiated, run on a PC with a microphone and speaker. These replace "hard" phones — whether they be IP, digital or analog. For a large corporate client that's particularly interested in the "soft" side of IP telephony, we recently conducted a survey on the state of soft phones.

First the good news:

- All leading IP telephony vendors — including Cisco, Avaya and 3Com — now offer soft phones, and most are quickly expanding the scope of their telephony applications.
- Soft phones are generally less expensive than the hard phones they supplant, although not by as much as you might expect. Soft phone licenses cost $100 to $200, compared with $200 to $300 for a digital phone, and from $200 to $500 for an IP phone.

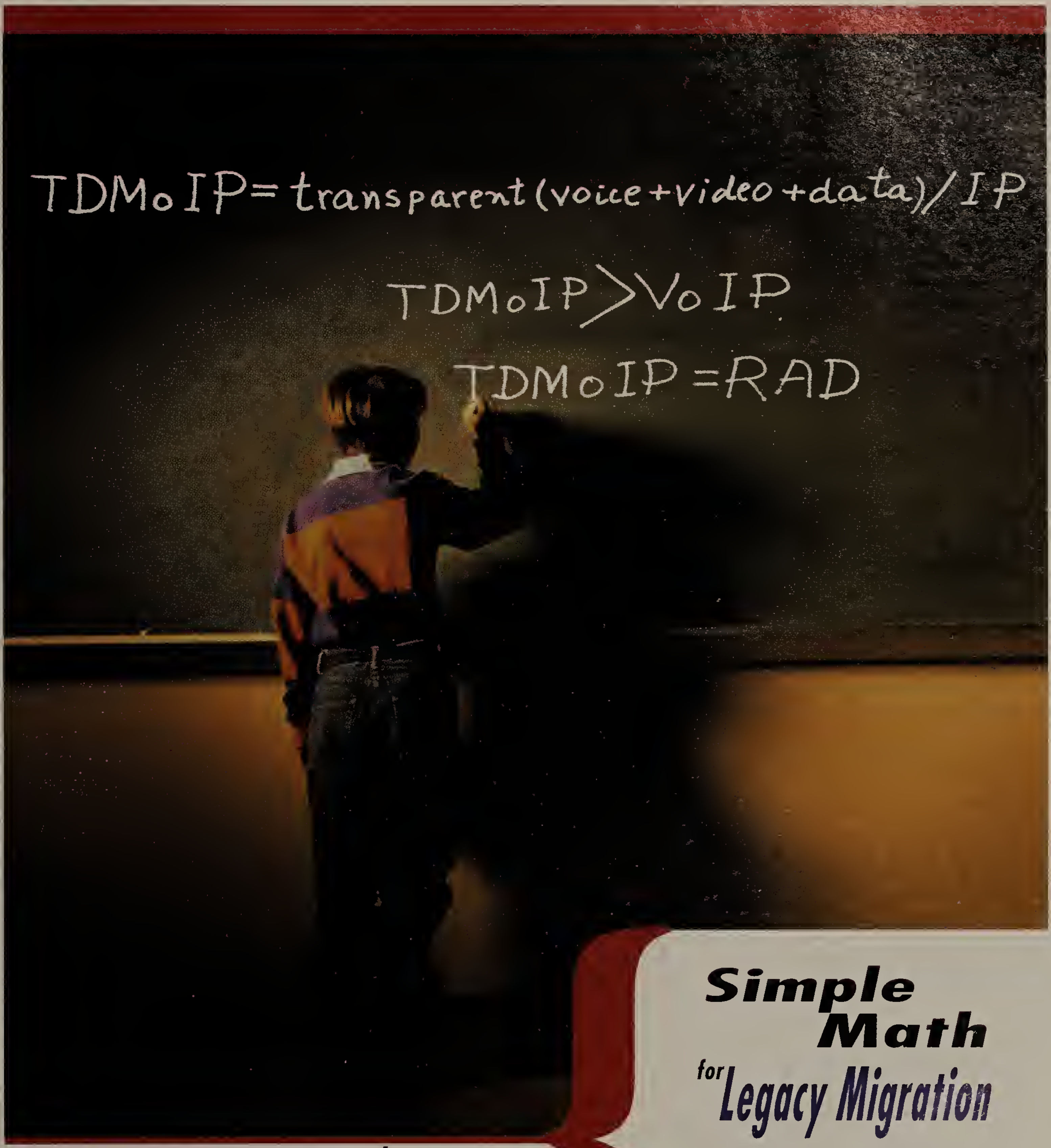
Now for the bad news:

- Don't expect a broad selection of soft phones that will work with your IP telephony system. We tracked down nearly 40 independent vendors that claimed they were working on soft phones during the past 18 months. More than half are out of business.
- Of a dozen third-party vendors that are still working on soft phones, only two said they expected their wares to work with popular IP telephony systems because most of the leading vendors still use proprietary voice-over-IP protocols.
- When we asked the leading IP telephony vendors if they know of any third-party vendors whose soft phones would work with their systems, all but one responded with a terse "No."

Don't assume that all soft phones are created equal, or even similar. We have exercised enough soft phones to conclude that their features, functions and ease of use are widely divergent.

It may be possible, someday, to load and run a universal voice-over-IP phone application on your laptop. But that likely won't happen for a few years. Soft phones represent the bleeding edge of this new technology, and it's an area that's screaming for comparative tests. Stay tuned.

Mier is the founder of Miercom, a network consultancy and testing center in Princeton Junction, N.J. He can be reached at ed@mier.com.



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Lessons in leasing

Purchasing pointers on when to shell out the dough for new equipment and when it's better to lease.

BY DREW ROBB

You need more bandwidth right now, but the company is in the grip of layoffs and budget cuts. Should you scale back your plans and purchase only the most crucial equipment, or lease everything you need and saddle your firm with payments for three years?

Network executives regularly wrestle with the thorny issue of whether to buy or lease network equipment and applications. Unfortunately, there is no pat answer that is right for all situations.

"From a tech viewpoint, it would probably be easier if we had the cash in hand and simply purchased," says Charles Savage, MIS director for Atkinson-Baker, a court reporting firm in Glendale, Calif. Nevertheless, due to tax and other financial advantages, he leases 80% of the company's equipment, including servers, hubs, routers and switches, as well as the network operating system and groupware.

If you're facing the lease vs. buy dilemma, consider these guidelines for making a decision and getting the most from a leasing deal.

HARRY CAMPBELL

1. Lease when you're short on cash.

"Unless they are strapped for capital, companies tend to buy equipment," says Carl Pitasi, an analyst with IT consulting firm Compass America. For those experiencing cash flow problems or budget cutbacks, leasing offers the ability to acquire gear right away.

For educational, nonprofit and healthcare organizations in particular, leasing opens the door to more advanced technology. "Leasing provides the flexibility to refresh technology as needed and provides a steady monthly cost so there is less of an impact on the budget," says Mike Nunnelly, a network administrator for Deaconess Hospital in Evansville, Ind.

However, the ease with which leased equipment can be acquired carries with it the same potential for overspending as credit cards. So don't go increasing bandwidth just so employees can download MP3s. Instead, adopt a firm policy of only leasing equipment that will lead to greater productivity or higher income.

2. Buy equipment you're going to keep a long time.

Decide how long you'll be using the equipment. If it's more than three years, consider buying; otherwise, leasing might be more attractive. Gartner analyst Lawrence Orans points out that core routers and switches are relatively mature technologies with a five-year shelf life, so you should probably buy them. On the other hand, less mature components such as load balancers are typically upgraded every two to three years and make better candidates for leasing.

3. Be careful choosing a lessor.

What you may not know is that once the paperwork is signed, many firms will sell your lease to a financing company that collects the payments and enforces the terms. This can create trouble, especially when it comes time to close out or renew the lease. So search around for a leasing company that will be there for you in the long term.

Atkinson-Baker went through several leasing companies before settling on American Equipment Leasing, now a part of CitiCapital. "The relationship between the three parties — the vendor, the lease company and us — is very important," Savage says. Nowadays, he ensures that all parties work well together before signing anything.

It also helps if you can find a lessor that will cover equipment, software and installation. Most specialize in hardware, since that can be repossessed. But it simplifies life if a lease covers an entire project and rolls everything into one monthly payment.

4. Pay close attention to lease terms.

Before signing, pull out your crystal ball and take a look at what happens when the lease expires. A common problem with leasing is not understanding the terms of the agreement and getting into a bad deal.

"We do a lease buyout, never planning to return the equipment at the end of the term," says Thomas Ranalli, IT director for Lyon & Lyon in Los Angeles. This puts his intellectual property law firm in control of when and what equipment gets replaced rather than it all being dictated by the lease terms.

If you want to trade in hardware at lease termination for new models, closely examine terms regarding return or disposal of equipment, extension of the lease and added fees.

5. Focus on the bottom line.

Because it all comes down to money in the end, you should have a good grasp of financial basics and how they relate to equipment acquisition.

That way, you can competently advise the CFO in terms of return on investment and optimizing cash flow. Be sure, then, to take into account the full range of financial factors, such as taxes, interest rates, amortization, depreciation and lost opportunity to make the most informed decision.

These can swing the final price of equipment up or down by 20%, depending on your firm's financial situation.

Although the CFO may end up making the final decision whether to buy or lease, if you know the game and the business repercussions, you'll be in a better position to recommend the right course of action.

Robb is a freelance writer in Los Angeles specializing in technology issues.

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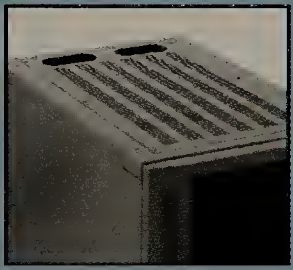

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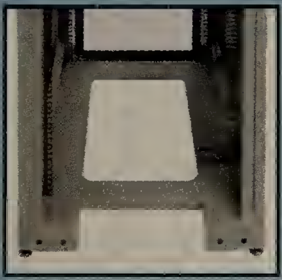

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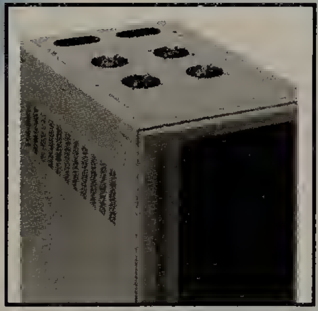

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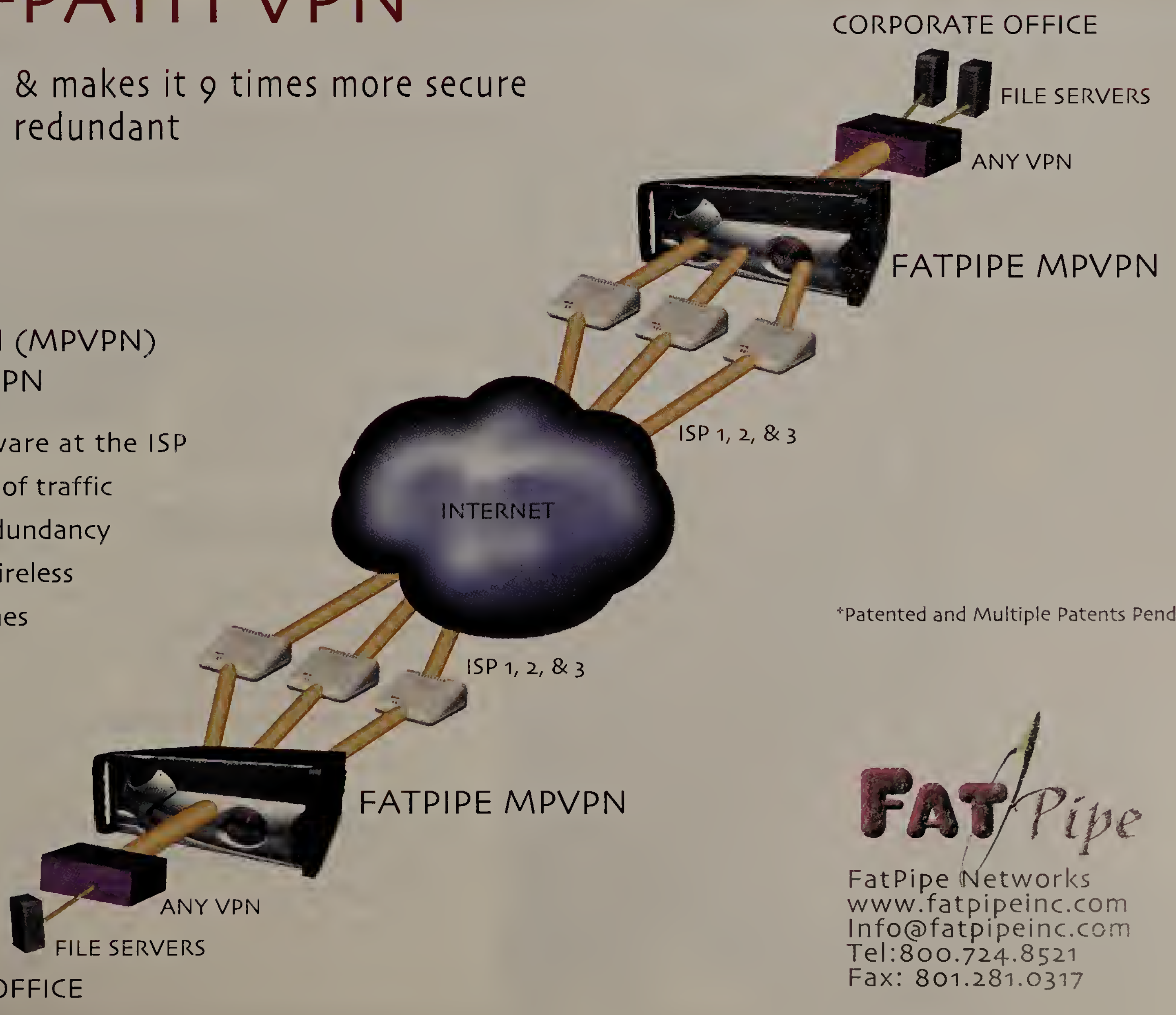

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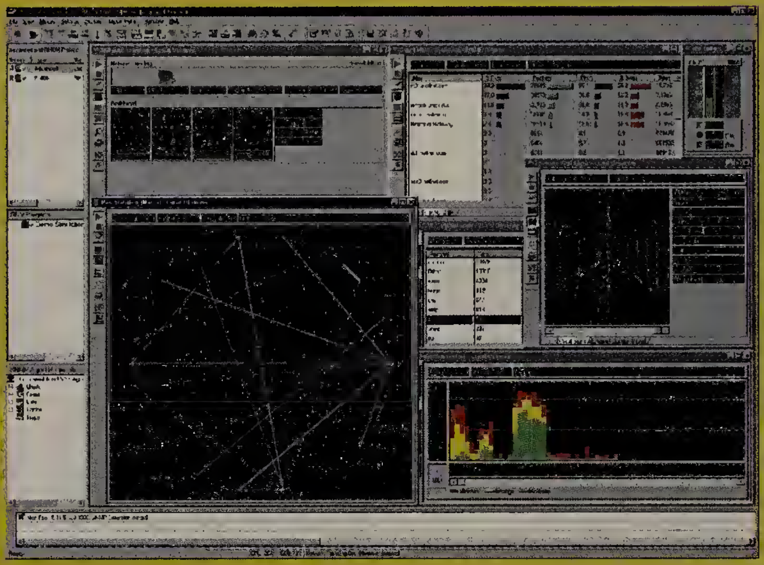

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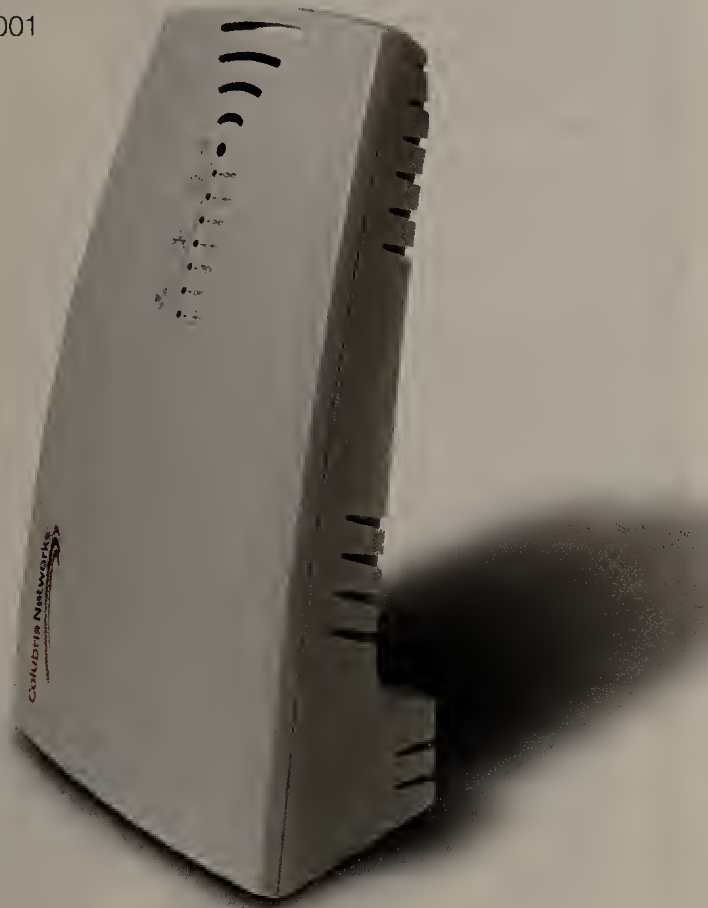

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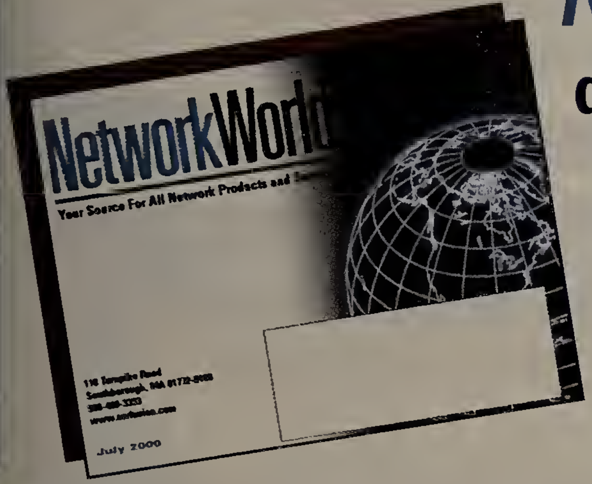

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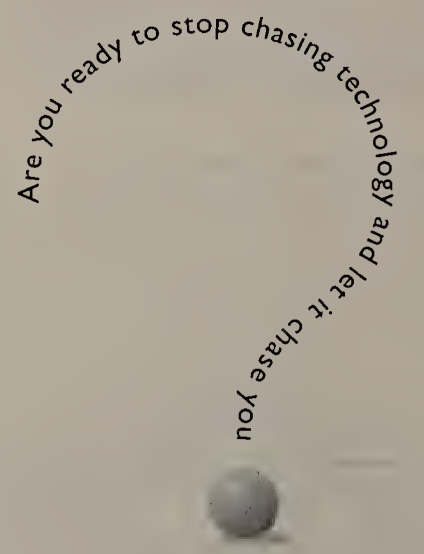

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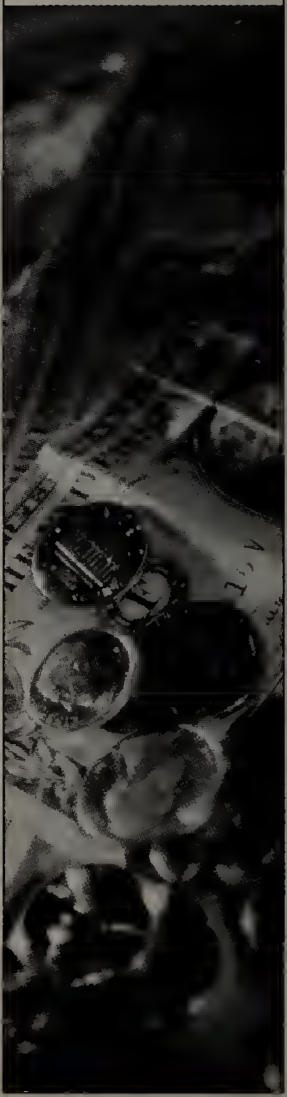

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Winstar

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more than a billion.

So this whole myth of a lack of demand for broadband and a lack of interest in alternatives to the RBOCs is just that, a myth. And it's great evidence of Wall Street's schizophrenia. We consistently exceeded what we projected, consistently exceeded what the industry projected, and yet at some point in 2000, Wall Street decided this industry shouldn't be financed. Just kind of woke up one morning and said, "Ah, no."

They went from being willing to tolerate the risk associated with long-term business plans where the horizons were measured in decades to demanding instantaneous returns. That's really what happened: The financial markets completely changed the metrics of success.

Why?

When the Internet bubble burst, the wave of destruction swept into our industry and people didn't have either the strength or ability to determine which business plans made the most sense, which made the least sense. Wall Street didn't distinguish between dot-coms and companies that were building real assets, real revenue, real cash flow, real businesses. The wave indiscriminately wiped everyone out.

Those CLECs that aren't bankrupt yet, what's the difference? You tell me. What's the difference between XO, McLeodUSA and us, today? Their equity values have been withered away to absolutely nothing. So they're only down 99%, instead of down 100%.

How was this manifested in Winstar?

We never got the chance to find out because Lucent put us out of business before we were impacted by the environment. That's the subject of a big lawsuit that will go on for a while.

Can you give us a thumbnail of the $10 billion Lucent suit? As I understand it, you defaulted on something and then they pulled the rug from...

That was pre-emptive P.R. We didn't default on anything. They defaulted. They just came out and said we were in default and therefore they weren't going to fund us, when in fact they were in default because they didn't fund us.

What was Lucent funding?

It was an all-encompassing line put in place in 1988 and renewed in May of 2000 for equipment and for the buildout of our network. The way it worked is we advanced money, every quarter, to subcontractors on their behalf and then they reimbursed us. And they didn't reimburse us. So we were out $90-some-odd million. But even worse was they indicated they weren't going to make any more payments. So we had to figure out how to replace them for the year, or else we were in trouble. So we were in trouble.

Could you make payroll?

We had a $1 billion investment plan for the year 2001. Between network building and operating expenses, at that point we were consuming close to $80 million per month. So pick your place. We were using money across the board, for salaries, for interest payments, for everything. And once they took $400 million out of our hands it wasn't something we were able to deal with.

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- What Wall Street wants from young companies today.
- What happens to half-built CLEC networks?
- Why investors might try to jump-start Winstar.

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Didn't Lucent have a lot of skin in the game?

I think they were facing a series of difficult choices. How much could they afford? The answer was, they couldn't afford to give us $400 million this year. I sometimes liken it to an ailing giant, stepping on a lot of tiny people as they're stumbling, trying to figure out how to stop from toppling over themselves.

Is part of the problem with the CLEC market that there are too many players?

That's another thing people like to say, that there were too many people competing. If you think about the way industries get created, you have many players at the beginning doing work that needs to be done and that is too hard for big companies to do. Big organizations are not good at doing entrepreneurial things, and in the infancy of an industry entrepreneurs do the heavy lifting. They create the first level of businesses and then it makes sense to amalgamate and drive efficiencies.

PHOTO/CHRISTOPHER WEIL

Winstar CEO Bill Rouhana Jr. says the business didn't change, Wall Street did.

Were there a couple of hundred CLECs and could we have done with a few less? Of course. But is that the reason for this? Uh-uh. To say this is the reason that things went the way they did is like saying there wasn't demand for broadband. It's revisionist history.

You told me you planned to reach 8,000 buildings by the end of 2000 and be in 60 domestic markets. How did you do?

In fact we got to 74 markets, because we reached 14 international markets as well. We didn't get to the 8,000 buildings, we got to something like 4,000. But we were on track to get to 9,700 in 2001. We were stopped at the end of the first quarter of 2001 because we declared Chapter 11 on April 18. At the time, we reached slightly more than 5,000 buildings worldwide. But we had to sell our international businesses or close them in Chapter 11, so that took a chunk off.

And now we're focusing — focusing is the right word because we haven't closed any domestic markets, we haven't turned off any domestic customers — on 28 of the 60 markets we're in.

What do you have in those markets?

We have 3,248 buildings that are done, and 1,050 more buildings under construction. That is, they are almost done but still need a little bit of capital to finish them off. So we'll be serving more than 4,200 buildings when in those 28 markets.

Now the business as we envisioned it at 9,700 buildings at the end of this year was capable of sustaining our overhead and our interest costs as they were then in place. Today, we have a very reduced cost structure and we've sold all kinds of ancillary businesses that we can't afford to be in anymore, our media businesses, little ISPs we had purchased and some other things.

And with our very focused core we're approaching cash flow breakeven, including capital, but we're not there yet.

We'll have taken that $80 million per month investment of capital and operating losses down to something approaching $5 million per month by the end of this year. That's a $75 million per month change in our consumption of cash. A pretty dramatic swing, and it has been traumatic getting there because we've had to lay off a lot of excellent people.

What would allow you to exit Chapter 11?

Well, we're looking for investors and we recently announced that the company is up for sale. So either of those two things would allow us to do it. A sale would of course be an exit, and there's been a fair amount of interest so far. But who knows. In this environment it's very difficult to predict what people are going to be willing to do.

Back in '99 you thought the business would unfold like this: You'd deliver a DS-3 to a building and, if you signed up one customer which bought 20 lines, that would cover the cost of the buildout and leave you with 650 channels to service other customers in that building. Did it work that way?

It turned out a lot better. In those days, a DS-3 took a whole channel. Today we are running OC-3s — three DS-3s — on a single channel, and we have OC-6 radios that can support six DS-3s on a single channel and OC-12 radios in the labs. That process of technology enhancing our ability to drive bits per hertz way exceeded my expectations. We took capital costs down from $3,500 a T-1 to under $50 a T-1.

Wow.

Wow is the right answer. And two thirds of our buildings today are built with those new economics. So I think the future of fixed wireless is just as vibrant, if not more so, than it was when we first talked about it. I've yet to

See Winstar, page 61

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Winstar

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find a way to deliver fiber to buildings that is cost-competitive, simply because it's so labor intensive.

How many customers do you have today?

A little over 30,000 businesses. And I'm going to guess there are more than a million people in those businesses.

Is there a sweet spot in terms of your customer profile?

No. In fact, we've gone out of our way to make sure we have attractive packages for all sizes of customers in our buildings. That's our sweet spot: 3,248 buildings, 99,055 businesses. And we stratify those businesses. How many have 100 or more employees, how many have 21 to 99 employees, how many have one? And each group has its own set of products.

For our smaller customers, the 1 to 20, we have the combination of high-speed Internet, voice and long distance by the minute. For our midmarket customer we have what we call Premier Access, which is bigger bandwidth. And then the biggest guys have a whole series of products, the private line products, DS-3 products, etc.

How would you handicap the race between the remaining CLECs?

In the bankruptcy process you have the ability to restructure your business. I'll give you an example. We have a deal with Qwest that has been completely repriced to current fair market value. We used to pay them $9 million quarterly. We now pay them $250,000. We're saving millions and millions of dollars every month just by being able to bring things to fair market value.

Now, if you are not out there trying to do that, it's going to be hard for you to compete with us. After a while, it's an unfair fight. This is the big burden facing the remaining CLECs.

How much debt are you left with?

Right now, effectively none. We have a debtor-in-possession loan of $175 million and it's the only debt we pay interest on. Two of our vendors have agreed to become participants in that, so that brings it to $250 million, roughly.

It sounds like your banking background served you well for the situation you find yourself in.

That and my legal background have both helped me.

I didn't know you had that.

Yeah, I was a lawyer, too. Seven years a lawyer, ten years a merchant banker, so it has helped a lot. But the No. 1 thing that has helped has been the relationships we have built over seven years. We're grateful to suppliers, vendors, and customers. Customers have been unbelievably great. We've had customers agree to defer credits, saying "you need the money more than we do." It's amazing.

How does fixed wireless compare to wire line services.

Our network performs much better than most wireline networks. Customers don't care whether you've got the best switch in town if everything between the switch and their office breaks every day. They care about the overall performance. That's measured by troubles per 100 lines; that's why we have to report that to the regulators. Winstar's trouble per 100 lines are consistently under .5. That makes us way better than anybody else. Verizon, which is delivering better and better service in terms of network metrics, is down to 1.2 per 100 lines; twice as high as us. But still, they used to be 2.4, so you have to give them credit. And 2.4 is actually the standard you have to meet. ■

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BackSpin Mark Gibbs

Turning appalling into despicable

Received: 09/12/01 05:48 Pacific Daylight Time / Subject: **A Call To All Americans . . . Dear friends of Flowgo, Like the rest of the world, we are shocked and dismayed by the sinister attack leveled at the proud city of New York today. We would like to take this time to say that our thoughts and prayers are going out to the victims and their families. . . . Here is a simple message to pass to all your friends and family to help in this effort [URL]. . . . Together we can get through this."**

— message sent out by Flowgo, apparently a division of eUniverse Network, to a significant portion of the company's reputed list of 40 million names.

The above was one of a half-dozen messages on the same theme I received on the morning after the suicide attacks. There may have actually been more but my spam filters are getting pretty good. As you might guess, I have an issue with these messages.

At first blush you might assume that the letters are heartfelt expressions of sympathy. Unfortunately that seems unlikely for several reasons. First, sending generalized expressions of condolence to anyone you do business with is spam, nothing more. When I discussed this issue with the public relations woman for Flowgo, she responded, "Do you think it would have been better if we had sent out our usual messages with dancing bears?" to which the answer is, of course not! What the company should have done was refrain from sending out anything.

Second, the messages were not devoid of PR pitch. Sure, as the PR woman pointed out, the company wasn't making a big fuss of the program and expecting newspapers to pick up on it. But the value of putting your company name and Web site URL in front of as many as 40 million people is not to be taken lightly, particularly when it conveys a good citizen image in the current context..

Third, when you go to that URL there's a poem backed by the Stars and Stripes and a button labeled "Press here to e-mail and tell a friend about this page." The page you wind up at requires you to enter your name and e-mail address to continue and, if you supply your gender, ZIP code, birth date and telephone number, the company offers you the chance to win $50,000.

You then enter the e-mail addresses of your friends. Next, the page offers you the opportunity to sign up for contests about "special offers" and "fun newsletters." Finally, you have to choose one of three submit buttons, each of which results in a different advertising page with a fake progress meter at the top that purports to be tracking the status of sending the messages (to keep you looking at the ad). If you hit the back button, you get a wholly inappropriate cartoon ad for a "must-see comedy."

Need more evidence of the selfish commercial nature of this pitch? The message your friend receives from Flowgo reads: "A call to Americans (by Just Say Wow) / Click below to see this page and to join the Just Say Wow mailing list: [URL] / To just visit the recommended page, click here: [URL] / We also thought you might be interested in the following SPECIAL offer! / Get a FREE copy of your credit report online!!! [URL]."

Shawn Gold, eUniverse's CEO sent me a message defending this campaign and saying, "You have to understand that this is what we do everyday. Sending out positive, inspirational messages. . . . If you read the content on our site and talk to the people that create it, you will find eUniverse is about as appropriate as it gets when it comes to helping Americans communicate how they feel and turn these unfortunate events into one of union and strength."

Shawn, I did read the content on your site, and given the context, I am disgusted. Companies using this kind of crass commercialism are appalling at the best of times. Given our current circumstances, they are simply despicable.

Your outrage to nwcolumn@gibbs.com.

Compendium Stuff you just can't miss.

By Adam Gaffin

What was that Dickens line? "It was the best of times, it was the worst of times."

For every site like Amazon.com or PayPal that set up a system for making online donations to help survivors of last week's attack, there seemed to be a company that tried to capitalize on the disaster via spam (see Gibbs above and www.nwfusion.com, DocFinder: 6046 for our page of online resources).

For every individual who set up a site to discuss how to give aid or just talk, there was another trying to sell bombing-related stuff on eBay (congratulations to eBay for cutting off such auctions and to the unnamed survivor who, on seeing somebody collecting World Trade Center rubble to sell on eBay, punched him).

Still, and above all, the Internet once again showed its strength as a medium for people to share their feelings and accounts of what happened. Some examples:

Escape from the subway

"People were shouting at us: Get out of the station! Get off the trains! There's been a terrorist attack!" DocFinder: 6047

Nearby resident

"I saw the second plane hit the building as I was on the phone with my wife, who was staying at her parents with my 3-week-old son. I saw debris fly everywhere and a huge fireball. At that time I told my wife I love her and ran to put on some clothes and flee my apartment. ... Everyone was getting as far away as possible. As I walked I saw people jumping or falling from the building's upper floors. I will never forget that sight for as long as I live." DocFinder: 6048

Taking refuge

"One Asian lady had apparently breathed in a large amount of the overpowering cloud, and was not able to breathe. We carried her inside the building, and someone who had medical training took over trying to help her. She coughed up some very horrible things and then seemed to die." DocFinder: 6049

Living four blocks away

"Everything was covered in a snow of dust a few centimeters high. Papers from all sorts of businesses were strewn across the street. There was a stark silence, broken by a few officers in the area. Looking up towards the WTC, I could see nothing but a brown cloud. I started heading north on Broadway. Even with the mask I was wearing, it was getting hard to breathe and my eyes were stinging." DocFinder: 6050

I'm Canadian

"I was doing better today, until a short while ago when I was at a cafe for breakfast. As I stood in line, someone (very loudly and in a very accusing tone) asked: "Are you from Afghanistan??" All eyes turned upon me, burning, each one accompanied with accusatory frowns. Needless to say, I very sheepishly said: "I am not from Afghanistan," then I quietly left . . . with an empty stomach and almost crying.

"I felt so small, and I now feel so unsafe and uncomfortable." DocFinder: 6051

You'll find more links to photos and first-person accounts at DocFinder: 6052

Still more

Doc Searls lives in California and has been posting his thoughts on his Weblog:

"Walking back from a meeting at school this evening, Jeffrey and I looked up at the sky, as always. But it was ... different. What was that behind the high branches of an oak tree? A star or an — no, it couldn't be an airplane. There were no airplanes in the sky tonight. Only stars: a condition we haven't seen in nearly a century.

"'Why aren't the planes flying, Papa?' Jeffrey asked. I explained. He asked again. I explained again. I stopped the questioning when the count got to four.

"But it won't stop." DocFinder: 6053

Send along any site suggestions to agaffin@nww.com.

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